INSTRUCTION MANUAL

ARC FUSION SPLICER

Read this instruction manual carefully before operating the equipment.
Adhere to all safety instructions and warnings contained in this manual.
Keep this manual in a safe place.

Table of Contents

§ 1.Warnings and Cautions for Safe Operation

Fusion splicer is used in different outdoor environment for fiber splicing “field splicing”,User must be aware that arc fusion splicing maybe brings some dangers. Therefore safety requirements are included in this instruction manual.

- Read this manual carefully and completely before operating the splicer.
- Adhere to all safety instructions and warnings contained in this instruction manual.
- The actual item may vary from the photographs.
- Retain this manual for future reference.

⚠ WARNING

1. Never operate the splicer in an environment where flammable liquids or vapors exist. Risk of dangerous fire or explosion may result from the electrical arc in such an environment.
2. Do not use the splicer near any hot equipment or in any place of high temperature . Possible equipment failure or fire may result.
3. Do not touch the splicer, AC power cord and AC plug if your hand is wet. Possible electric shock may occur.
4. Do not operate the splicer if water condensation is present on surface of splicer. This may result in electric shock or equipment failure.
5. The splicer is precision adjusted and aligned. Do not allow the unit

to receive a strong shock or impact. Possible equipment failure may result. Use carrying case to transport and store the splicer. The carrying case protects the splicer from damage, moisture, vibration and shock during storage and transportation.

6. Do not place the splicer in an unstable or unbalanced position. The splicer may shift and lose balance, causing the unit to fall. Personal injury or equipment damage may occur.
7. Keep the splicer free from sand, dust, lubricants and other contaminants. The presence of such substances may degrade the splicing performance and cause equipment failure or damage.
8. Do not use any chemical other than alcohol to clean the objective lens, V-groove, mirror, LCD monitor, etc., of the splicer. Otherwise, blurring, discoloration, damage or deterioration may result.
9. The splicer requires no lubricatimn. Oil or grease may degrade the splicing performance and damage the splicer.
10. Do not use compressed gas or canned air to clean the splicer. They may contain flammable materials that may ignite during the electrical discharge.
11. Do not store the splicer in any area where temperature and humidity are extremely high. Possible equipment failure may result.
12. Before using the shoulder belt of carrying case, inspect the belt and hook for excessive wear or damage. Carrying the case with a damaged belt may cause it to fall and may result in personal injury or equipment damage.
13. Do not touch the electrodes when the splicer is on and power is supplied to the unit, the electrodes generate high voltage and high temperatures that may cause a severe shock or burn. Turn the splicer

off, and disconnect the AC power cord, or remove the battery pack when replacing the electrodes. (Note: Opening the wind protector stops arc discharge.)

14. Do not disassemble or modify the splicer, AC adapter, battery pack, or DC adapter. In particular, do not remove or bypass any electrical or mechanical safety device (e.g., fuse or safety switch) incorporated in this equipment. Modification could cause damage that may result in personal injury, death or electric shock or fire.

15. Use only the 85-260V AC, 47-63Hz/12V DC, 14Ah with fusion splicer. The proper supply voltage source is 85-260V AC, 47-63Hz, Check the AC Power source before use. Using an improper AC power source may cause fuming, electric shock or equipment damage and may result in personal injury, death or fire.

16. Use the supplied AC power cord. Do not place heavy objects on the AC power cord. Do not pull, heat up or modify the AC power cord. Use of an improper cord or a damaged cord may cause fuming, electric shock or equipment damage and may result in personal injury, death or fire.

17. Connect the AC power cord properly to the splicer and wall socket. When inserting the AC plug, make sure there is no dust or dirt on the terminals. Incomplete engagement may cause fuming, electric shock or equipment damage and may result in personal I jury, death or fire.

18. The fusion splicer uses a three-prong(core) AC cord that contains an earthed ground safety mechanism. The splicer MUST be Grounded/Earthed. Use only the supplied three-prong(core) AC power cord. NEVER use a two-prong(core) power cord, extension cable or plug.

19. Use only the approved battery pack with the splicer. Only the battery pack we provided can be used as the approved battery pack.
20. Use the specified charger cord to recharge the battery pack. Using other battery chargers and charger cords may cause fuming or equipment damage and result in personal injury, or death and it could cause a fire.
21. The splicer inlet is used to disconnect the power cord in the event of a fault. Be sure to position the splicer so that the power cord can be disconnected easily and quickly.
22. Disconnect the AC or DC power cord from the splicer inlet or the wall socket(outlet)immediately if the splicer or the external battery emits fumes, a bad smell, or becomes noisy or hot. Leaving the abnormal condition unattended will cause equipment failure, electric shock or fire and may result in personal injury, death or fire.
23. Disconnect the AC or DC power cord from the splicer inlet or the wall socket (outlet) if the splicer becomes damaged (e.g., by dropping). Leaving the splicer in a damaged state may cause equipment failure, a fire and may result in personal injury, electric shock, death or fire.
24. Disconnect the AC or DC power cord from the splicer inlet or the wall socket(outlet)immediately if liquid (e.g.,water) or foreign matter (e.g.,screw) enters the splicer. Leaving the splicer in a damaged state may cause equipment failure, electric shock or fire and may result in personal injury, death or fire.
25. Caution should be taken when removing the fiber protection sleeve from the tube heater after the heat shrink cycle is completed. The

tube heater and fiber protection sleeve are hot and should not be touched. This could cause a burn.

26. Replace the electrodes properly.

- ***Use only specified electrodes.***
- ***Set the new electrodes in the correct position.***
- ***Replace the electrodes as a pair.***

Disregard of the above instructions may cause abnormal arc discharge and result in equipment damage or degradation in splicing performance.

27. The equipment must be repaired or adjusted by a qualified technician or engineer. Incorrect repairs may cause fire or electric shock.

- ***We will not take responsibility for personal injury or equipment damage caused by incorrect use or repair.***

§ 2. Description

§ 2. 1. Specification

1	Applicable Fiber	Single mode and multi mode silica based optical glass fiber • Cladding diameter: 80 - 150um • Coating diameter : 250-1000um
	Cleave Length	8-22mm (Standard spec : 16mm)
2	Mean Splice Loss (Note 1)	• Single mode fiber(SM): Typ.0.02dB • Multi mode fiber(MM): Typ.0.01 dB • Dispersion shifted fiber(DS): Typ.0.04dB • None Zero Dispersion Shift(NZDS): Typ.0.04dB
	Mean Splice Time (Note 2)	Typ. 9 seconds
	Fiber Protection Sleeve Shrinking Time (Note 3)	20mm/40mm / 60mm sleeve: Typ.40seconds
3	Dimensions	170mm(W) / 170mm (D) / 140mm(H)
	Weight	3.3 kg
4	Battery/Charger	Battery pack with battery charge function • Input power : 85～260 V (47～63HZ) • Output power: 12V, 10Ah
5	Proof Test Force	• Standard spec. : Approx.1.96N (200gf)

6	Program test	Atmospheric pressure (maximum altitude : 5000m)、temperature and humidity. Automatic calibration by observing distance of the GAP during arc discharge
	Wind Resistance	Maximum permissible wind velocity: 15m/s
7	Type of Splice Mode	AUTO, MANUAL
	Program of Splice Mode	SM、MM、DS、NZDS、EDF
	Storage of Splice Results	8000 splice results in internal memory

Note 1: Mean splice loss:

Data based on splicing same-type fibers having an average quality according to the ITU-T standard.

Note 2: Mean splicing time

- Length of time from the start of operation by pressing START till the end of loss estimation.

Note 3: fiber protection sleeve shrinking time

- Length of time from the start of heating by pressing  till the end of cooling.

§2. 2. Components

No.	Name	Fig.
(1)	Arc Fusion Splicer	

(2)	Li-Battery	
(3)	AC adaptor	
(4)	AC Power Cord	
(5)	Charger	
(6)	Spare Electrodes	
(7)	Instruction Manual	
(8)	Carrying Case	
(9)	Cooling salver	
(10)	Fiber Optic Stripper	
(11)	Fiber Cleaver	

Fig 2-1 Standand Package

§ 2. 3. Necessary Accessories for Operation

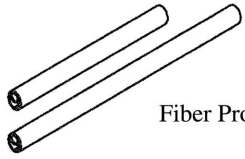
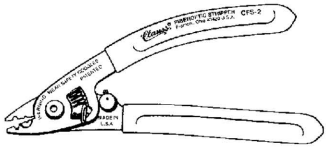
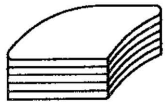
Fiber Protection Sleeve	 Fiber Protection Sleeve
Coat Stripper	 Fiber/Pigtail Coat Stripper
Fiber Cleaving Tool	 Fiber Cleaver Cleave Length: φ0.25:6-20mm φ0.9:10-20mm
Fiber Cleaning Tool	 Dispenser (Purity:more than 99%)  Lint-free tissue or Gauze  Thin Cotton Swab

Fig.2-2 Other Necessary Items

§ 2. 4. Description and Function of Splicer

§ 2.4.1. Main Body of Splicer:

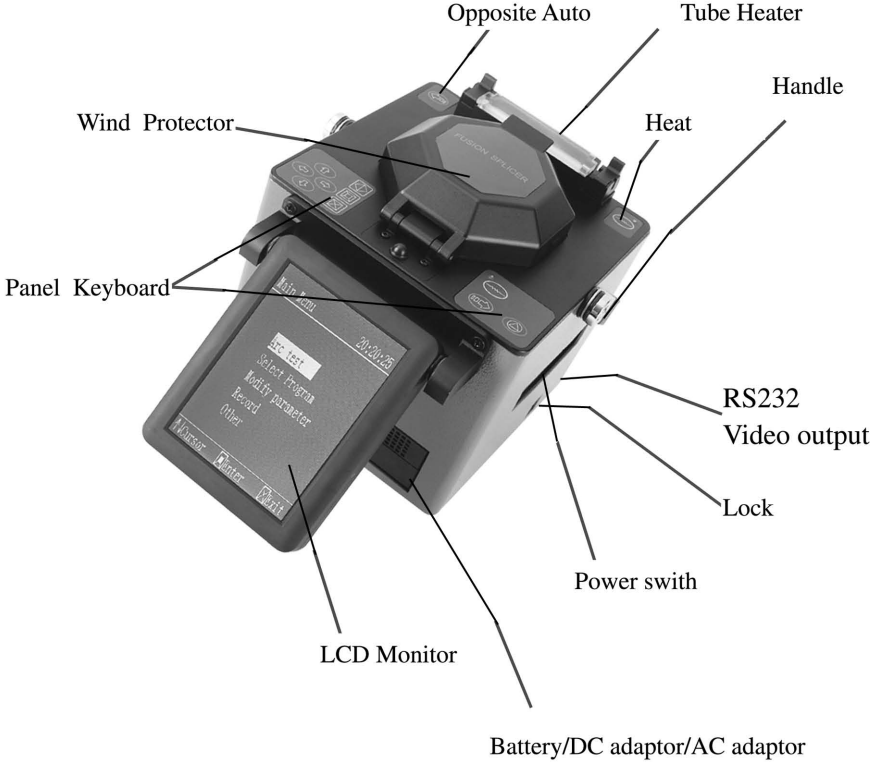


Fig.2-3 Splice Main Engine

§ 2.4.2. Panel Keyboard

（1） Right Keyboard

Fig.2-4 Right Keyboard

Key	Name	Function
	**Heat**	**Start/stop tube heater**
	**Start**	**Start splice operation**
	**Reset**	**Splicer Reset**

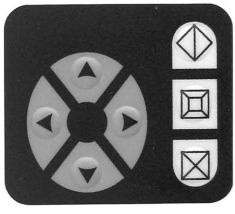


Fig 2-5 Left keyboard

Key	Name	Function
	Alternate	Manual: left/right,up/down
	Menu	1. Enter Main Menu 2. Confirm Menu
	Exit	Exit Menu
	Down	1. Menu: move cursor down 2. Manual: move fiber down
	Up	1. Menu: move cursor 2. Manual: move fiber up
	Right	1. Menu: modify parameter 2. Manual: move fiber right
	Left	1. Menu: modify parameter 2. Manual: move fiber left

§ 2.4.3. Power Supply Switch and Plugs

Fig.2-6 Power Supply Switch and Plugs

	Power ON/OFF
	Video output
	RS-232 interface

§ 3. Detail of Splicing Operation

§ 3. 1. Preparations before Splicing Operation

Prepare necessary items, referring to chapter § 2.2 Necessary Accessories for Operation

§ 3. 2. Power Supply

Three ways of supplying power to the fusion splicer: AC Power supply 、internal battery、external battery .

⇨Warning: Follow safety instructions, refer to chapter § 1 Warnings and Cautions for Safe Operation

§ 3. 2. 1. Using AC Power supply

To operate the splicer from an AC power supply 85～260VAC, 47～63Hz

(1) Confirmation before operation

⇨Check: Make sure the power source is 85～260VAC, 47～63Hz.

Warning: When connecting to an AC generator, always check the output voltage of the generator with a circuit tester before connecting the AC power cord.

⇨Check: Make sure the AC power cord is free from damage, etc.

(2) Plug AC adapter into splicer.

(3) Plug the AC power cord into the AC adapter inlet  , Make sure plug is fully seated and in the correct position.

(4) Plug the AC power cord into the wall socket. Make sure plug is fully seated and in the correct position.

(5) Press  , turn on splice.

§3. 2. 2. Using internal battery pack.

Power supply with internal battery.

(1) Plug internal battery into splicer.

⇨Check: Check the battery is seated properly.

(2) Press<  >, turn on splicer.

§3. 2. 3. Using external battery.

①Plug DC adapter into splicer.

②Plug DC Cord(one end) into DC adapter ,an other end into external battery

③Press<  >, turn on splicer;

§3. 3. Turning On Splicer Power

⇨Check: To ensure splicing is of good quality, perform the cleaning and checking procedures before beginning splicing operation. Refer to chapter §5.1

§3. 3. 1.Power-On

Pressing<  >turns on the power and displays Power-On Menu

§3. 3. 2 . Ready Screen

①Currently selected mode

◇AUTO:[Working Mode]

Optional mode: AUTO
MANUAL

◇ SM :[Fiber Type]

Optional mode: SM
MM
DS
NZDS
EDF
EXF

◇16:14:04 :[TIME]

②information

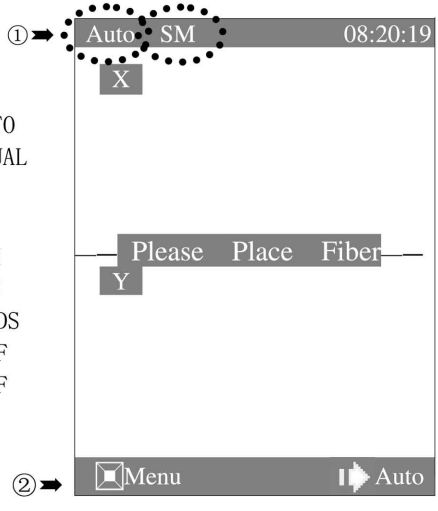


Fig.3-1 READY Screen

⇨Note: If change working mode or fiber type, Press< > setup menu.

§3. 4. Fiber Stripping Operation

§3. 4. 1. Cleaning the Outer Coating

Clean the fiber outer coating approx. 100mm in length from the fiber end with alcohol-impregnated gauze or lint-free tissue. If dust or other impurities on the outer coating enter the fiber protection sleeve, burnout or breaking of fiber may result after completion of installation.

§3. 4. 2. Passing through Fiber Protection Sleeve

Pass one fiber through the fiber protection sleeve. Refer to Fig. 3-2

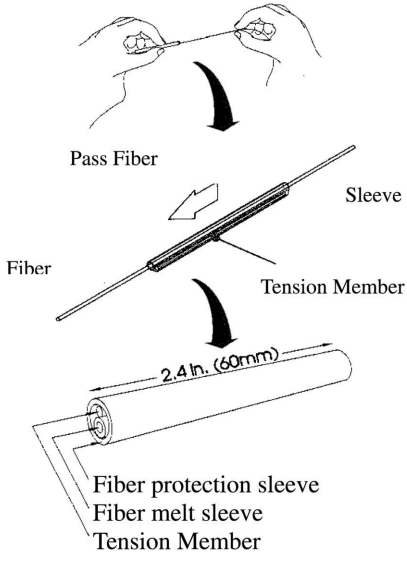


Fig. 3-2 Pass Fiber

§3. 4. 3. Stripping and Cleaning

(1)Remove the fiber coating 30-40mm with a stripping tool.

⇨Check: After this operation, handle the fiber so as not to damage its bare glass.

(2) Clean the bare part of the fiber with another alcohol-impregnated gauze or lint-free tissue.

⇨Check: After this operation, handle the fiber so as not to damage its bare glass.

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

⇨Check: Change gauze or lint-free tissue regularly to ensure cleanliness. Refer to Fig. 3-3

Fig. 3-3 Fiber Stripping

§3. 4. 4. Fiber Cleaving

⇨Note: The cleave length for ∅0.25mm fiber is 8mm to 16mm .

The cleave length for ∅0.9mm fiber is 14mm .

the standard cleave length is 16mm .

Detailed steps are as follows :

Fig. 3-4 Main Body

Before cleaving, remove the fiber coating 30-40mm with a stripping tool, then clean it with alcohol.

1. Open the cover and pressure pad, put the stripped fiber on the V-groove. And make sure that the cleaver length is set as per operators' intended length. 	2. Close the pressure pad to fix the fiber. 
3. Close the cover and make sure that the end of the fiber is sticking out of the rubber pad exactly in a straight line. 	4. Push the blade carriage to the rear until it stops. 
5. Open the cover of the body. 	
6. Take out the cleaved fiber with care in order not to bring the harm to the end face of fiber. 	7. For the continuous operation, remove the cleaved fiber, in this process, be careful not to get injured by the cutting edge. 

§3. 5. Setting Fiber in Splicer

(1) Open the wind protector.

(2) Open the left and right sheath clamps.

(3) Place fiber in the V-groove.

⇨Check: Make sure the fiber is not twisted when setting it into the splicer.

⇨Check: If the fiber coating has curl memory, or bend memory, Load the fiber in such a manner that the crown (curve) of the memory is turned upward.

⇨Check: Care should be taken to prevent damage or contamination of the fiber end-face. Fiber end-face contact on ANY item including V-groove bottom may result in poor quality splices.

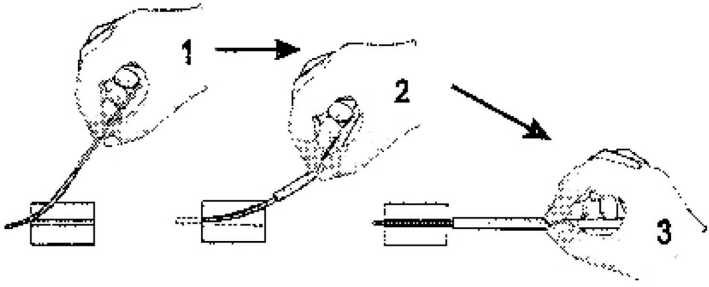


Fig.3-5 Setting Fibers I

(4) Gently close the sheath clamp while holding the fiber.

➪Check：Observe fiber setting in the V-groove. The fiber should rest in the bottom of the V-groove, Reload fiber if it does not rest properly.

➪Check：Fiber end-face should rest between the V-groove tip and electrode centerline. It is unnecessary that the fiber end-face be exactly at the midpoint.

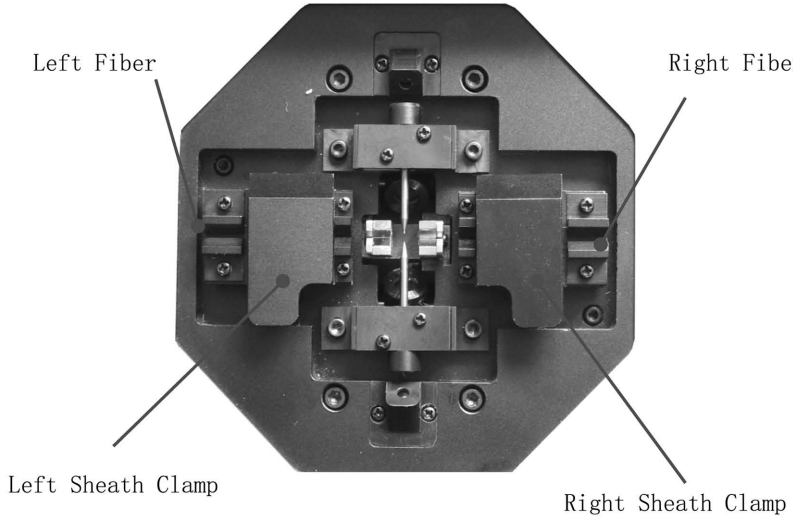


Fig.3-6 Setting Fibers II

(5) Repeat steps (3) and (4) for second fiber.

(6) Gently close the left and right fiber clamps.

(7) Close the wind protector.

§3. 6. Splicing Operation

The fusion splicer uses image processing to identify abnormal conditions that sometimes occur during the splicing process. A small portion of these defects sometimes goes undetected and a poor quality splice occurs. Visually inspect the fiber image on the monitor to confirm acceptance or rejection during the various stage of the splicing process.

(1)Start of splicing

Pressing< > moves the left and right fibers forward. After completion of cleaning arc discharge, the fibers stop at the predetermined position.

⇨Note: When the fiber are moving forward and they appear to hop up and down, contamination may be present in the V-grooves or the fiber surface, Clean the V-grooves and redo fiber preparation.

(2)Cleave angle measurement and alignment operation

Visually examine the condition of the fiber end-face while the splicer is in operation or at a pause.

⇨Check: If any of the below conditions occur, press< >(Reset button) and redo fiber preparation.

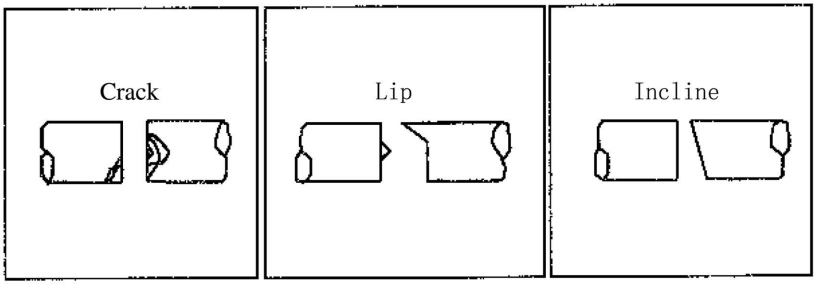
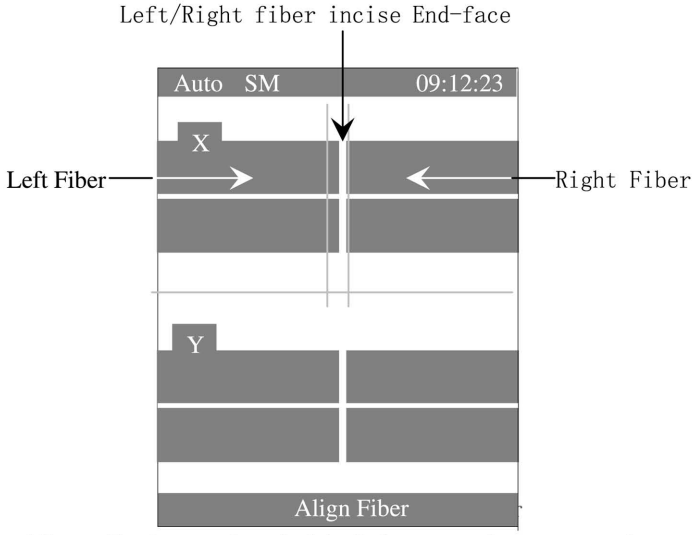


Fig. 3-7 State of Fiber End-face

When the threshold of cleave angle error is exceeded an error message is displayed ："Left Fiber End-face badness " or"Right Fiber End-face badness", Then redo the relevant fiber cleave.



⇨Note：To change threshold of cleave angle error，refer to chapter §5. 5

(3) Heating with arc discharge

After aligning the fibers, the splicer will produce a high voltage arc discharge to fuse the fibers together. During arc discharge, observe the fiber image on the monitor screen. If some part of the image exhibits an extremely bright glow (hot spot),which is

created by burning contaminants located on the surface or end-face of the fiber, there is a possibility that the fiber core will be deformed. Although deformation can be detected by the loss estimation function, a re-splice is recommended.

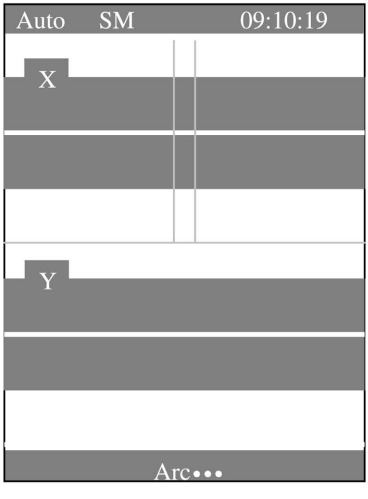


Fig.3-9 Fibers Being Spliced

(4) Splice Inspection

When the spliced state is abnormal, the splicer displays an errormessage "Splice Lost".A re-splice is recommended.

⇨Note: It is best to perform an arc test at this stage for the splicer to determine the best program for the fiber type.

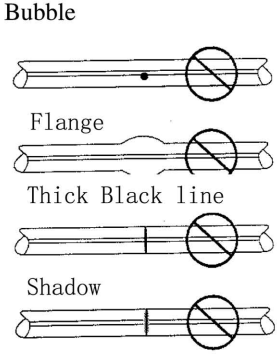


Fig. 3-10 Examples of bad Splicing

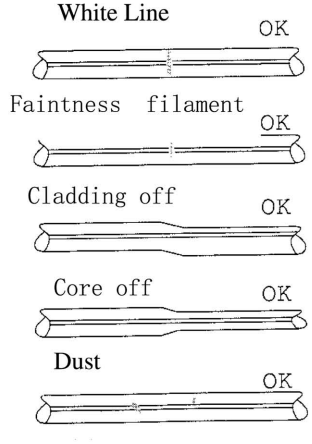


Fig. 3-11 Examples of good Splicing

➪Note: A slightly fat splice is normal. There is no problem with the splice loss and reliability.

➪Note: White line or black line will appear on fiber's joint with fluorine and titanium, Because of optics, There's no effect to joint.

(5) Splice loss estimating

The estimated splice loss is displayed on the screen.

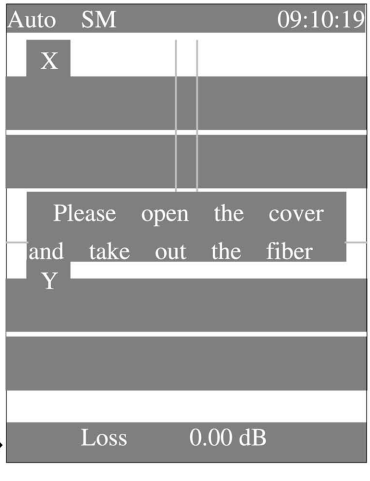


Fig.3-12 Result of Fiber Splicing

In some cases the splice loss can be improved with the re-arc feature. Press the <⇨>. After re-arc discharge, Not displayed of splice loss.

➪Note: There are cases when the splice loss will deteriorate after re-arc discharge.

(6) Storing splice resultPress<  >or open the wind protector and the splicer Will automatically perform the proof test and stores the splicing result. The Splicer can storage 8000 item splice result, Refer to chapter §5. 7. 4 Splice register if transfer the splice result。

§3. 7. Fiber Removal

(1) Open the wind protector

⇨Check: Heater clamps should be open, ready to receive fiber and splice protector sleeve.

(2) Open the left sheath clamp, holding the left fiber in your hand.

(3) Open the right sheath clamp, holding the right fiber in your hand.

(4) Remove the fiber from the splicer.

§3. 8. Reinforcing the Splice

(1) Slide the fiber protection sleeve to the center of the splice and move it to the tube heater.

⇨Tip: Make sure the splice point and fiber protection sleeve are in the center of the tube heater.

⇨Tip: Make sure the reinforcing material is placed downward.

⇨ Tip: Make sure the fiber is not twisted.

(2) While applying tension to the fiber, lower the fiber into the tube heater. The left heater clamp will close automatically.

(3)Keep the tension on the fiber, close the right heater clamp with your left hand.

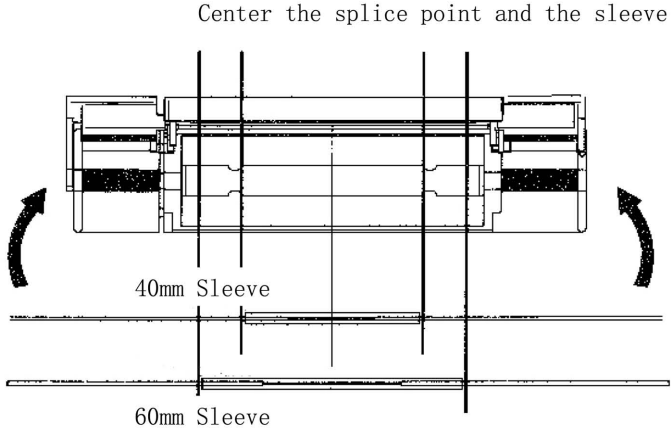


Fig.3-13 Setting in Tube Heater

⇨Tip: Check again to see that the splice point and fiber protection sleeve are in the center of the tube heater.

(4) Press<>to start a tube-heating cycle. Upon completion of heating, The heater LED will turn off.

⇨Note: To abort the tube heating cycle, press<>

(5) Open the left and right heater clamps. While applying tension to the fiber, gently remove the splice reinforcement.

⇨Note：On occasions the fiber protection sleeve may adhere the bottom of the tube heater. Simply use a cotton swab or similar soft tip object to gently push the fiber protection sleeve free.

(6)Visually check the splice reinforcement for bubbles and impurities. Three reasons for possible reheating are shown below.

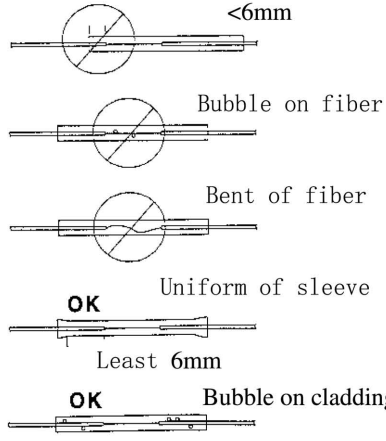


Fig.3-14 Possible result

§3. 9. Storing the fusion splicer

Fusion splicer is a precision instrument. Its carrying case is especially design to protect the product when transporting.

- ⇨Check: Cleaning the crucial parts periodically i.e. Pickup camera, Lamp-house lens, Fiber press and V-groove.
- ⇨Check: LCD cover is fitted and that it is stored correctly before fitting in carrying case.
- ⇨Check: Lift the fusion splicer cased the carrying case.
- ⇨Check: That the other fittings and accessories fitted securely in the carrying case
- ⇨Note: Remove any liquid i.e. alcohol, IPA from the carrying case.

§4. Maintenance of Splicing Quality

§4. 1 Cleaning and Checking before Splicing

Critical cleaning points and maintenance checks are described below.

§4.1.1 Cleaning V-grooves

If contaminants in the V-grooves, correct clamping may not occur, resulting in higher splice loss. The V-grooves should be frequently inspected and periodically cleaned during normal operation.

(1) Open the wind protector and fiber clamps.

(2) Clean the bottom of the V-groove with an alcohol-impregnated thin cotton swab as shown in Fig. 4—1. Remove excess alcohol from the V-groove with a clean dry swab.

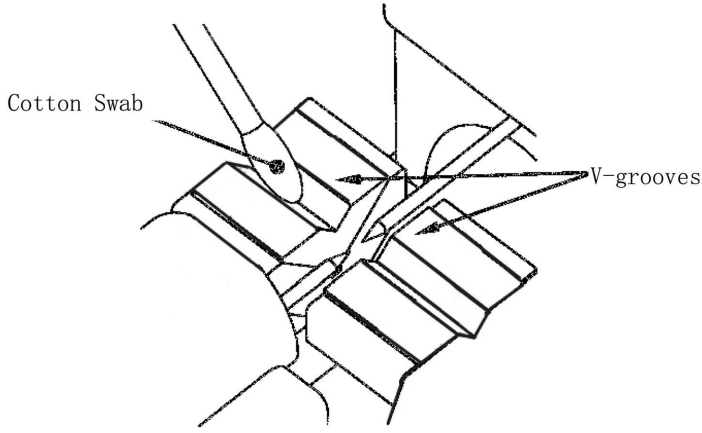


Fig.4—1. Cleaning V-grooves with Cotton Swab

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

⇨Check: Use care not to contact the electrode tips.

⇨Check: Do not use excessive force when cleaning the V-grooveThe V-groove may get damaged.

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

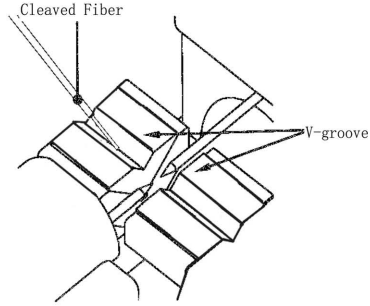


Fig.4—2 Cleaning V-grooves with Cleaved Fiber

§4.1.2. Cleaning Fiber Press Stand

If contaminants are present on the clamp chips, correct clamping may not occur, resulting in poor quality fiber alignment splices. The fiber clamp chips should be frequently inspected and periodically cleaned.

(1) Open up the wind protector

(2) Clean press stand surface with an alcohol-impregnated thin cotton swab as shown in Fig4-3. Romove excess alcohol from the press stand surface with a clean dry swab.

Check: Use a high quality alcohol, greater than 99% pure

cotton swab fiber press stand cleaning fiber press stand

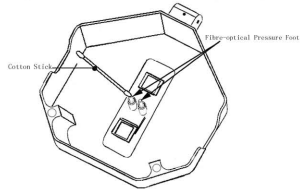


Fig4-3 Cleaning Fiber Press Stand

§4.1.3. Cleaning Mirrors surface

If the mirrors surface becomes dirty, the core position may be incorrect due to decreased optical path clarity, resulting in higher splice loss.

(1) Clean the mirror surface with an alcohol-impregnated thin cotton swab as shown in Fig.4—4. Remove excess alcohol from the mirror surface with a clean dry swab.

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

(2) Mirror should be clean and smudge free.

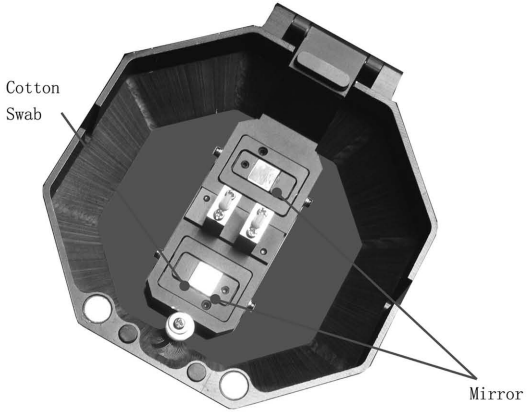


Fig.4—4 Cleaning Protector Mirrors

§4.1.4 Program Test

Atmospheric conditions such as temperature, humidity, and pressure are constantly changing which create variability in the arc temperature. The splicer contains a temperature, humidity and pressure sensors that are used in a constant feedback monitoring control system to regulate arc power at a constant level. Changes in arc power due to electrode wear and glass adhesion can not be corrected automatically. Also, the center position of arc discharger sometimes shifts to the left or right.

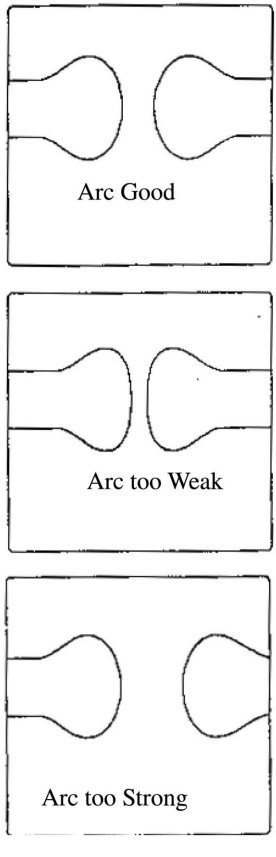


Fig.4-5 program test

Step: Prepare two cleave fibers

(1)Program test need twain fiber. According to commonly fusion means vs fiber stripper、sever and placed (Refer to chapter §3. 4 Preparation Fiber).

(2) Press< >enter "Setup Menu", Fluctuate arrowhead move to "Program Test", Press< >start program test.

(3) program test automatically adjust discharge intensity. Repeat test until screen display " Arc good right " Refer to Fig.4-5 Discharge distinguish)。

(4)After program test, Press< >exit and return to automatic splicing state。

§4. 2 Periodical Checking and Cleaning

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

§4.2.1.Electrode Replacement

Electrodes wear with use and also must be cleaned periodically due to silica oxide buildup. It is recommended that the electrodes should be replaced after 3,000, a message prompting to replace the electrodes is displayed immediately after turning on the power. Using the electrodes without a replacement will result in higher splice loss and reduced splice strength.

⇨Note: Arc discharge count alarm for electrode replacement may be changed.

Replacement Procedure

(1) Power down unit.

(2) Remove the old electrodes. For the method of replacement, refer to Fig.4-6.

(3) Clean the new electrodes with alcohol-impregnated clean gauze or lint-free tissue and install them to the splicer.

⇨Check: Use approved electrodes for the splicer.

⇨Check: Be careful not to damage the electrode shaft or tips when cleaning and installing in the splicer, Any damaged electrodes should be discarded.

⇨Check: When installing the electrodes, tighten screws no more than finger tight while pushing the electrode collars against the electrode fixtures, Incorrect installation of the electrodes may result in greater splice loss or damage to the circuit.

(4)Turn on the power, prepare and load fibers into the splicer,

Press<  >enter “Setup Menu”,Move arrowhead to “Program Test”,

Press<  >start discharge test.

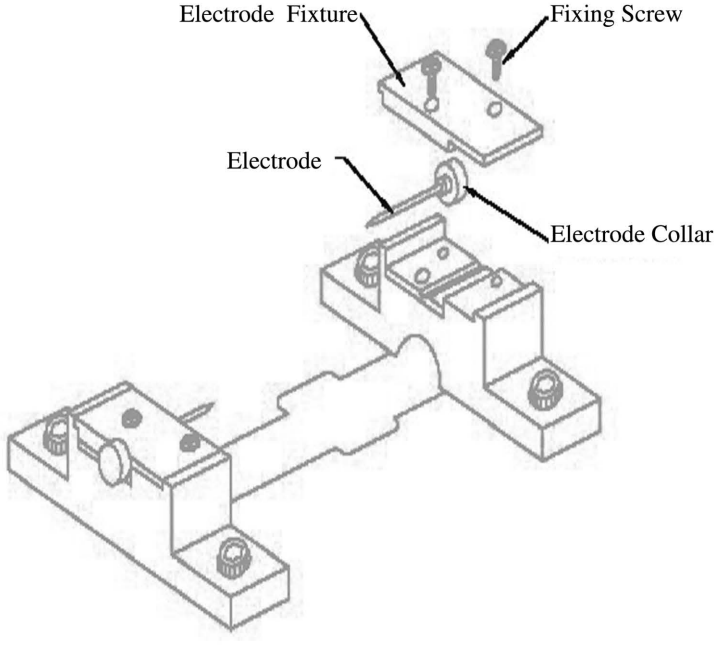


Fig.4—6 Replacing Electrodes

§4. 2. 2. Cleaning Objective Lenses

If the surfaces of the objective lenses become dirty, normal observation of the core position may be incorrect, resulting in higher splice loss or poor splicer operation. Therefore, clean them at regular intervals. Otherwise, dirt may accumulate and become impossible to remove.

(1) Before cleaning the objective lenses, always turn off the splicer.

(2) Remove the front and rear electrode covers.

(3) Gently clean the lens surface with an alcohol-impregnated thin cotton swab as shown in Fig.4-7. Using a cotton swab, starting in the center of the lens, move the swab in a circular motion until you spiral to the edge of the lens surface. Remove excess alcohol from the mirror surface with a clean dry swab.

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

⇨Check：Be careful not to bend the electrodes.

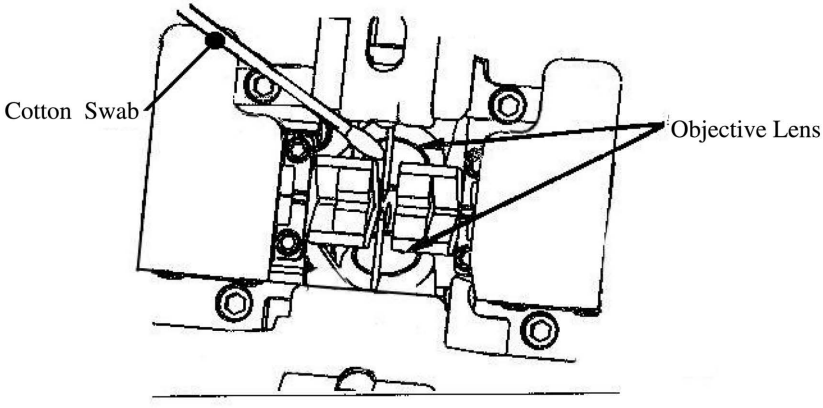


Fig.4—7 Cleaning Objective Lenses

(4) The lens surface should be clean and smudge free.

(5)Reinstall the front and rear Electrode covers.

(6) Turn on the power and make sure no smudges or streaks are visible on the monitor screen.

§4. 2. 3. Regular maintanence of Battery

(1) The internal battery is lithium battery without memory, which could be charged at any time. The first charging operation should last 18 hours to increase battery functional efficiency. The later charging operation should last about 6 hours, the red indicator light means the charging is ongoing,when it turns to green, meaning the charging is completed. Fusion splicer will stop work when the battery voltage is under 9V. The internal battery has the function of power indication. Press the button of indicator light, when four indicator lights are green, that means it is full of charge, partial green,means partial power, red light indicates the need of charging.

(2) The external battery is lead-acid battery, monthly charging is suggessted. Regular charging is required to enhance service life when it was not used for a long time. The charging usually last about 10 hours

Attention:When the low-battery indicator light works, it means the voltate is under 10. 5V, charging is needed. Otherwise, over-discharging will occur which would reduce the service life of battery

Attention: The Fuse will break off when short-circuit occurred or the current is over 15A. Please replace the broken Fuse and check the circuit.

§ 5. Menu Commands

§ 5. 1 Menu Commands Tree

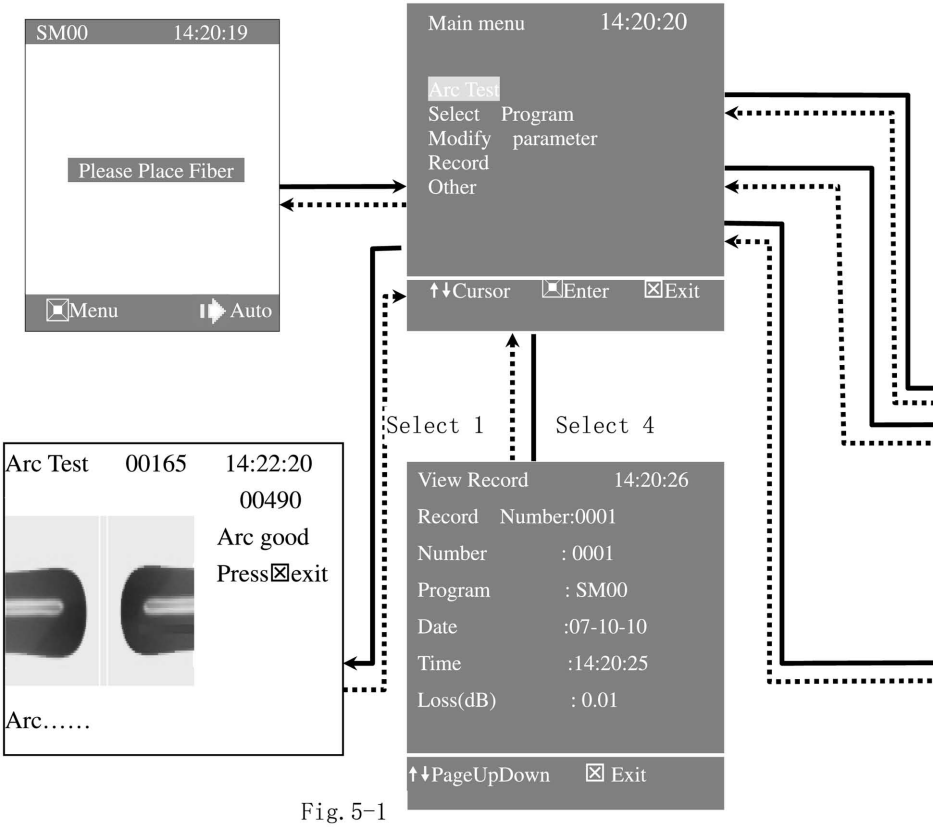
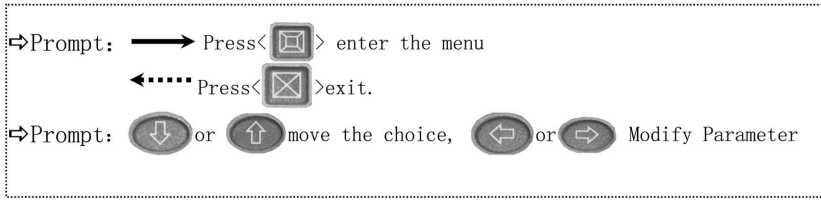
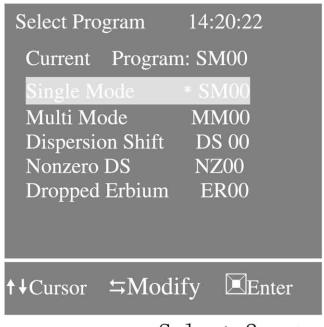
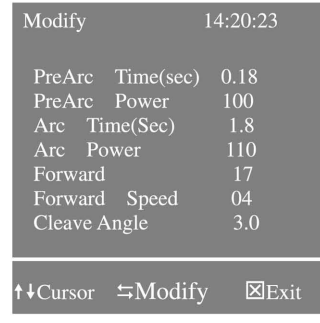


Fig. 5-1



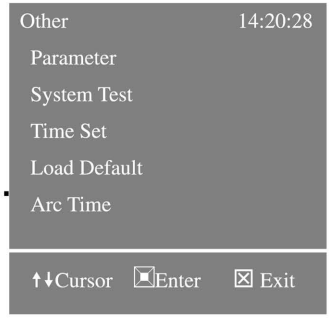




Select 2

Select 3

Select 5



§5. 2 Program Test

Atmospheric conditions such as temperature, humidity, and pressure are constantly changing which create variability in the arc temperature. The splicer contains a temperature, humidity and pressure sensors that are used in a constant feedback monitoring control system to regulate arc power at a constant level. Changes in arc power due to electrode wear and glass adhesion can not be corrected automatically. Also, the center position of arc discharger sometimes shifts to the left or right.

(1)Place two cleaved fiber in the v-groove

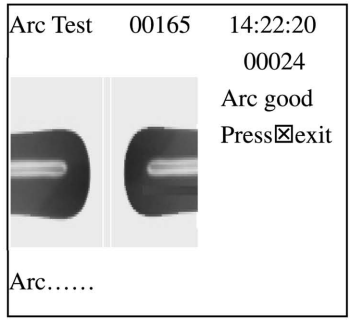


Fig. 5-2 Program Test

(2) In wait for state, Press< > key enter “Main Menu”, move to “ Arc Test”, Press< >key start Arc test.

(3) Arc test automatically adjusts arc intensity. Repeat test until screen display “Arc good”, (Refer to Fig. 5-2).

(4) After Arc test, Press< > key exit and return to automatic splicing state.

§5.3 Working Style

In wait for state, “ Main Menu” → “other” → “Parameter” → “work type”, Press “ ” or “ ” key to select Manual or Auto. Press< >key exit.

Fig. 5-3 Work Style

§5. 3. 1 Auto Mode

This mode for automatic fusion splicing and result check.

Clean and prepare fiber, select required fusion program in automatic menu process.

For most cases select this option. The Process will splice automatically without any user intervention.

§5. 3. 2 Manual Mode

In this mode, fibers will be spliced in steps by step operator controls. After fiber has been prepared and placed in position each step is auctioned by the operator using key control detailed below.

Key	Name	Function
	Alternate	Manual: Alternate L/R, up/down
	Down	Manual: Move fiber down
	Up	Manual: Move fiber up
	Right	Manual: Move fiber right
	Left	Manual: Move fiber left

➪Note: At the Manual mode, Not display loss.

§5. 4 Selects Program

In waiting state, “mail menu” →, “Select Program” →“Current Program” (Fig.6-5),Move cursor to fiber type, Press “⇦” or “⇨” key to select appropriate program(Fig.5-5) Press <☒>key exit.

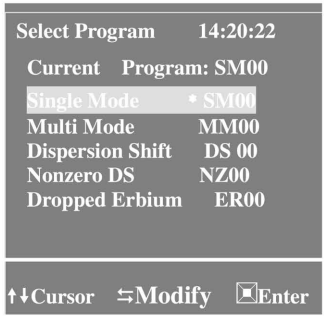


Fig.5-5 .6 kinds type fiber type

Fiber type	Meaning	Program
SM	Single mode	SM00-SM15
MM	Multi mode	MM00-MM15
DS	Dispersion shifted	DS00-DS15
NZDS	Non-zero Dispersion shifted	NZ00-NZ15
EDF	Erbium doped fiber	ER00-ER15

⇨Note: For different fiber, you should select a conformable fiber type program, Otherwise high splice loss value or splice defect can occur.

§5. 5 Program Modify

In waiting state, "Main menu→ "Modify parameter" → "Modify" (Fig .5-6) submenu. Move cursor to parameter. Press "⇦" or "⇨" key to modify parameter value, Press<⊠> key exit.

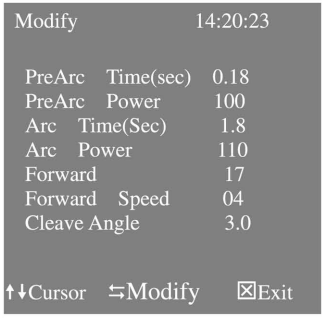


Fig.5-6

Function	Function Explain	Value area
PreArc Time	Prefuse Time	0～2.55
PreArc Power	Prefuse Power	0～255
Arc Time	Fusion arc time	0～25.5
Arc Power	Fusion arc power	0～255
Forward	Fiber move forward in fusion time	0～60
Forward Speed	Fiber move speed in fusion time	1～10
Cleave Angle	Fiber incise end-face angle	0～7.5

Note: Only parameter of program oo can be modified, parameter of program 01-15 is fixed by factory.

§ 5. 6 Heat Time

In waiting state, “Main menu”, → “other” → “Parameter”. Move cursor to “Heat time” (Fig. 5-7), Press “ ” or “ ” key to change the parameter. Press < >key exit.

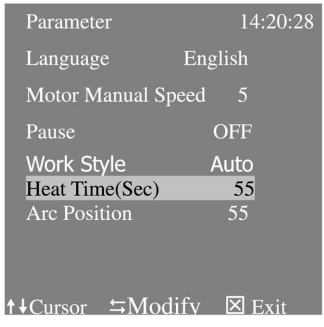


Fig. 5-7 Heat Time

§ 5. 7 Other

This submenu contains some assistant function and maintenance function.

In waiting state, “Main Menu” → “other” (Fig. 5-8), Press< >key screen display “ Other ” submenu. Press< >key exit.

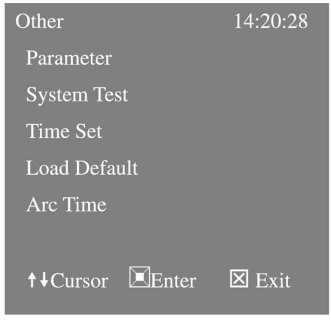


Fig. 5-8 Other

§5. 7 . 1 Time Set

Select this operation, to renew date and time. “Main menu” → “other” →“Time Set ”(Fig. 5-9), Move cursor to year, press “ ” or “ ” key to change the parameter. Press< >key exit.

Fig. 5-9 Date/Time

§5. 7 . 2 Arc Time

Select this operation, to examine fusion splicer total Arc Time.“Main menu” →“other” → “ Arc Time ” (Fig. 5-10), Press< >key to clear arc counter.

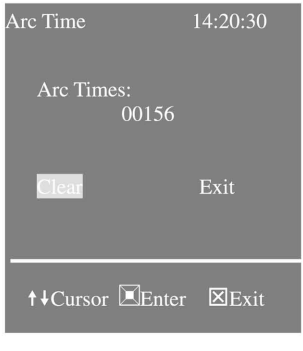


Fig. 5-10 Arc Time

§5. 7 . 3 Fusion Record

In waiting state , “Main menu” → “Record” (Fig. 5-11) → “View Record”, Select this operation, to examine newly Fusion Record.

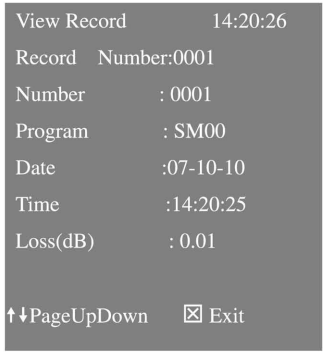


Fig. 5-11 Fusion Record

§5. 7 . 4 System Test

In waiting state “ Main menu” → “other” → “System Test” Press< >key , System automatically inspects the other parts of the machine(Fig. 5-12).

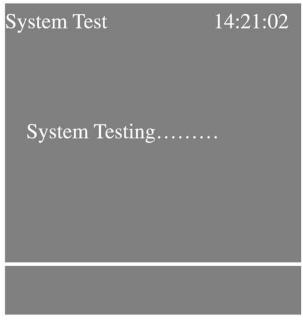


Fig. 5-12 System Test

(2) Pause

In waiting state , “Main menu” → “other” → “Parameter” Move cursor to “pause”(Fig.5-13), Press “⇦” or “⇨” key to “On” or “OFF”. Press< ☒ >key exit.

Fig.5-13 pause

(3) Load Default

In waiting state , “Main menu” → “Other” → “Load Default” , move cursor to the parameter, Press< ▣ >key, select “Yes” or “No”. If select “Yes”, Press< ▣ >key , splicer will restone program “oo” default parameter fixed by factory. Press< ☒ >key exit.

Note: this operation is valid just for program “oo’.

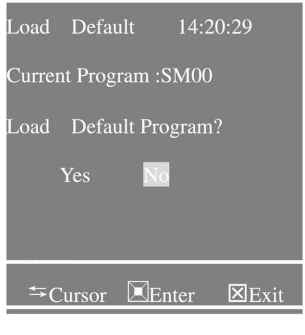


Fig. 5-14 Load default

(4) Language

In waiting state, “Main menu” → “other” → “Parameter” Move cursor to language(Fig.5-15), Press “ ” or “ ” key to select: “Chinese” or “English”. Press< >key save new value.

Fig. 5-15 Language

§5. 8 Exit

After change parameter value and press < >key exit.

§ 6. Transportation and storing

§ 6. 1. Warnings and Cautions for transportation

Fusion splicers are precision instruments. Do not transport unprotected as unit will suffer damage. Protect the unit from excessive vibration and collision. Always detach the battery from the splicer before transporting. Always transport the splicer upright in the carrying case. Check the splicer is undamaged before using, if in doubt then contact the manufacturer or an approved agent. NO WARRANTY will be given if unit is transported without the case.

§6. 2. Storing require

(1)Check the thing whether complete in the carrying case or has damnification at the transportation, Mostly components comprise:

No.	Name	Quantity
(1)	Arc Fusion Splicer	1
(2)	li-Battery	1
(3)	AC adapter	1
(4)	AC Power Cord	1
(5)	charger	1
(6)	Spare Electrodes	1
(7)	Instruction Manual	1
(8)	Carrying Case	1
(9)	Cooling salver	1
(10)	Fiber Optic Stripper	1
(11)	Fiber Cleaver	1

(2) Please note the fusion splicer is a precision and expensive instrument and should be well maintained to ensure it works to manufacturers specification.

(3) If the battery is not in use over a long period of time then we recommend that you charge it once a month. If used regularly charge at user discretion .

§6. 3. Storing fusion splicer

Keep in the carrying case at all times when not in use.

(1) Turn off power and remove mains lead.

(2) If required, clean splicer as required ie: Pickup camera: Lamp-house lens: Fiber press and V-groove, Wipe off any dust and fibres.

(3) Ensure LCD screen is vertical and the protective cover is fitted.

(4) Ensure all clamp and wind protector are in the down (storage) position.

(5) Lift carrying handle and place the fusion splicer in the carrying case.

(6) Place accessories in case securely and shut case.

⇨Note: Ensure any cleaning Alcohol is in a secure non leakage bottle or container before placing it in a case, for fear of spilling etc.

§ 7. Error Message List

Below is a list of error messages. If it is not possible to eliminate the problem, there is the possibility of the splicer being faulty and it must be returned to factory of an approved agent. Please supply the following information:

- Model name of the splicer
- Serial number of the splicer
- Error message
- Situation when the error occurs

No	Error Message	Reason	Remedy
01	Replace Left fiber	• The left fiber is set too far back.	• Reset, Moves left fiber forward
	Replace Right fiber	• The right fiber is set too far back.	• Reset, Moves right fiber forward
	Replace both fiber	• The left or right fiber is set too back.	• Reset, Moves left/right fiber all forward • Reset, Moves left or right fiber forward

No	Error Message	Reason	Remedy
02	Left cleave bad Right cleave bad	• Bad fiber end-face • Dust or dirt on the fiber surface. • “End-face angle” set up too strict • Dust or dirt on the objective lens or the wind protector mirror.	• Check the condition of fiber cleaver. When the blade is worn, rotate the blade. • Put “End-face angle” allowance higher to suitable degree • Re-cleave fiber as required • Clean the lens or mirrors
	Both cleave bad		
03	Please close the wind protector	• Unable to start splicing when the wind protector opens.	• The splicer will automatically starts splicing after closing the wind protector
		• The wind protector is opened during splicing operation.	• Press<  >reset after closing the wind protector
04	Fusion failure	• The fiber stuff value is insufficient.	• Increase stuff value in the parameter setup menu
		• The pre-fuse power is too strong.	• Recommended pre-fuse power in the parameter setup menu

No	Error Message		Remedy
05	Left Motor error Right Motor error	• Motor damage • Plug flexiable •Position swithch damage/flexiable	Return to factory or an approved agent.

§8. Questions and Trouble Shooting

§8. 1. Turning On Power and Power Supply

(1) Power does not turn off when pressing<  >.

Reason: 1. Power AC adapter/ Battery pack faulty
2. Power supply switch FAULTY
3. Short circuit or failure of internal electronics

Remedy: Check the power supply plugs or battery for good operation.

(2)Turn on fusion splicer, no visible Screen displayed

Reason: 1. Power AC Adapter/Battery not connected correctly.
2. Power supply switch faulty.
3. The fuse blown.
4. Splicer unit faulty
5. Ploarity reversed.
6. Controls incorrectly set

Remedy: Check whether the fuse is broken, If broken then replacing fuse (Fusion splicer for 8A, Power supply AC adapter 3A), Make sure power output voltage about 12～13V. Check whether the battery polarity is connect correctly. Check

whether the battery polarity is connected correctly. Check screen brightness control on the back of the LCD is in the appropriate position and turn on. If unit still faulty then return to service agent.

(3)After booting up the unit, an error message shows "system replacement "replacement cannot stop

Reason: 1.Fusion splicer switch has question or camshaft induce pole losed.

2.Electrical or electrical drive has something the matter.

Remedy: Disentangle the inner six corner bolt of twain at the nose cover board, Take the cover board. If the induce pole losed, Then anew insert bore of the camshaft, And using 502cement , Eliminate the dunghill with switch.If still had this question then return maintain branch .

§8. 2.Splicing Operation

(1)After the fibers are set, the image on the screen is grainy and dark.

Reason: 1. The wind protector problem or the spring piece contact badness.

2. The light did not shine on wind protector or the below electric mast connect desquamate.

3. The CCD is baded or desquamate (The pickup camera's shutter something the matter) .

Remedy: Using forceps nip spring at the wind protector bosom backend and put up ratherish. The new fashioned fusion splicer use two contact mast at the electrode seat . If still had this question then return maintain branch .

(2) Press"  ", The fiber remains static(no fiber movement) and fiber is not set too far back, press Reset, but the fiber still remains static.

Reason: 1. The fiber is break.

2. The press board did not pin the fiber.

Remedy: Relay the fiber and shut the press board, Draw backwards of the fiber, If moved then explain the press board did not pin the fiber. Check the compaction bar at the press board.

(3) Press"  ", The fiber moves forward but stops short and the slide runs out of travel unit. The display shows "A new Fiber" required.

Reason: 1. Fiber incise length short of require.

2. The sport bearing has obstacle.

Remedy: The incise length about 16mm, Afresh facture if short of require. At the sport bearing bunted, Check have or nothing the obstacle, Confirm station and transact.

(4)Press"  ", at one side the image fluctuates and is not upright. The end-face is not uniform and does not splicer.

Reason: 1. The V-groove has dust lead to the one side station higher, Bigness the max of the another side .

2. Microscope lens and floodlight or prism had ash and speckle.

Remedy: Clean the V-groove a few with nib toothpick touch alcohol .Then check the v-groove smoothness degree with fiber aim at V-groove bottom frontad impel. Clean twain microscope lens and twain floodlight. (Note: Use cleanlily cotton, Best rub a few.) If still had this question then return maintain branch .

(5) Splicer doest not align fibers correctly.

Reason: 1. Fiber dirty , End-face disqualification or incise reamer badness.

2. Microscope lens and floodlight or prism had ash and speckle.

Remedy: Adjust incise reamer, Afresh tailor fiber end-face. Clean the microscope lens, Floodlight . (Note: Using cleanlily cotton ,Had best rub several rounds. If still had this question then return maintain branch .

(6) Cleave angle poor

Reason: 1."End-face Setup "small.

2. Microscope lens and floodlight or prism have ash and speckle.

3. Floodlight not light.

4. Dust in the V-groove or virtual image.

Remedy: Enter menu, Augment "End-face Setup "value, Rub lens, Rub floodlight and check, Tautology after clean the V-groove. If still had this question then return maintain branch .

(7)Test fusion current small or big

Reason:1."Current Warp" in the parameter and "Fusion Current" small or big in the program.

2. Many deposit at the electrode, Aging grave.

3. Place happen variation of the fiber and arc.

4. High voltage power element mangle

5. Accumulator electricity lack or aging.

🗝 Remedy: Enter safeguard menu, Cleaning electrode and select "Arc position" Check fiber and arc station ,If in gear then select program 3 anew discharge test. If current smaller then increase "Current Intensity "value whereas minish . Where after anew test till current moderate. If still had this question then return maintain branch .

(8) Image position lean to screen of the end-face clearance. (Belong to fusion splicer automatic follow arc positional function, Adjust if departure to a fault

💣 Reason: 1. Electrode aging, Much deposit on the exterior.

2. Electrode slanting .

3. Lens loose excursion station.

4 . Discharge finished open the wind protector or incaution touch fiber at test discharge current, Fusion splicer judge arc station misplay.

🗝 Remedy: Enter maintenance menu , Cleaning electrode. Turn on proceed discharge test thrice upwards after turn off few minutes. Special case return maintain branch repair.

(9)Setting clearance and adjust normal, But not discharge of electrode in the fusion process.

💣 Reason: 1. Current parameter setup 0 or select program not setup parameter in the program menu.

2. High voltage power mangle or electrode connect shed.

🗝 Remedy: Enter menu check the just using program if in gear, Change become fusion parameter in gear. Whether return repair.

(10)Connect in gear, But estimate the wastage bigger or fusion be defeated.

Reason: 1. Examine system something the matter or microscope lens and prism have dust.
2."End-face Setup" value bigger in the menu.
3. Soon open the wind protector after discharge, Examine did not accomplish .

Remedy: Clean twain microscope lens and twain floodlight. Then minish parameter with "End-face Setup ". Process discharge test, Process connect after the current moderate, If still had this question then return maintain branch .

(11)Press"  ", Install clearance, Regulate all normal, But did not fusion, Burn two balls

Reason: 1. Splicing current too bigger.
2. The boost quantity smaller or zero. The boost rapidity bigger.
3. The press board did not suppress.
4. The pigtail at the right and per se quality badness, The envelope disengage.

Remedy: Replace dry circumstance test, If still had this question then return maintain branch . Make sure the fiber nothing the matter (For example: The pigtail envelope disengage), Then enter using program menu, Check the parameter , Setup right parameter and process discharge test until the current moderate. Playback the fiber, Press AUTO key check up otherwise return repair

(12)Blister and change thick or thin after MM fiber connect

Reason: 1. End-face substandard or surface dirty. 2. Program parameter has trouble.

Remedy: Pledge end-face all right, Tautology after test current moderate. Augment "Pre-fusion current、Pre-fusion time "value or minish "Fusion overlap" value if blister or change thick. Minish " Pre-fusion current、Pre-fusion time

(13)The connect index bigger (Practice measure)

Reason: 1.V-groove or fiber have dust.
2.Discharge current inappropriate.。
3.Not pointed with splice.
4. Electrode aging.
5.Program parameter mount unsuitable.
6.End-face or incise reamer badness.
7.Special fiber.
8.Operation adverse circumstances such as gale or aquosity.

Remedy: First ask test means, Desiree exactness test , Then clean(v-groove 、 Microscope 、 Electrode)select becoming program discharge test. Assure end-face all right . If index big then time after time test find the better program parameter via augment or minish the current.

§8. 3. Cleaning Maintenance

(1) Fiber cannot successfully enter and the fiber virtual image after clean the V-groove

Reason: 1. Cleaning the V-groove wise improper and that leave over "W" form nick.

2. The V-groove be out item beeline or plane.

3. The small press board has askew or the buffer has adhibit askew or dilapidation.

4. The small press board did not suppress the fiber. The familiar is pigtail.

Remedy: Using dull knifepoint lighter row with V-groove bottom .Open the big press board , Check aV-groove if at item beeline or plane. Close the big press board, Used the forceps adjust the height if the small press board did not suppress the fiber. Backtrack repair if the else circs cannot dispose.

(2)Else in gear, But did not discharge at cleaning the electrode.

Reason: 1. Circuit trouble.

Remedy: If influencer connect quality cannot clean electrode, Please return maintain branch.

(3)Electrode firework display or discharge of nearby coherer.

Reason: 1. Electrode connect loose.

2. Operation circumstance dampness.

Remedy: Replace dry circumstance test, If still had this question then return maintain branch .

§8. 4. Tube-heating Operation

(1)Fiber protection sleeve does not shrink completely

Reason: 1. Heating time setup short.

2. Environment temperature too low (like winter) make the heat shrink process inefficient.

Remedy: Extend heating time.

(2)Fiber protection sleeve adhered on heating plate after shrinking

Reason: 1. Part protection sleeve arouse adhered.

Remedy: Take out after cooling ; If time limit for a project is pressing did using cotton stir side lighter, Make complete disengage with heating plate.

(3)Cancel heating

Remedy : Press<  >cut no ice , Need continuous press<  >twice.

(4) Heating indicator light not light but can heating as usual.

Reason: 1. Connect has trouble or heater has trouble of the disunite heater.

Remedy: Check the disunite heater 1、2 feet whether electric conduction 6ohm and 3、4 feet electric conduction 10k。otherwise return maintain branch.

(5) Heating indicator light shine, But heater not heating; Or indicator light not shine and heater not heating.

Reason: 1. Heating key dull or baded.

2. Connect has trouble or heater has trouble of the disunite heater.

Remedy: Instead clavier if clavier dull; Check the disunite heater 1、2 feet whether electric conduction 6ohm and 3、4 feet electric conduction 10k 。 Otherwise return maintain branch.

Note: The above having question by any possibility of interior circuitry trouble.

§9. Instructions and Descriptions for Battery and Charger

§9. 1. User instruction of the polymer lithium-ion rechargeable battery

Scope

This specification is applied to polymer lithium-ion rechargeable battery produced by Unitedcells Co., Ltd.

Statement 1:

The customers should contact Unitedcells firstly if they want to use the battery in other conditions which are different from the specified devices or defined statement. As some special testing need to be done to verify the battery's characteristics and safety performance under such conditions.

Statement 2:

An accident or fire may occur because of improper usage of the battery. Unitedcells Co., Ltd. will not bear any product liability in case those accidents occur under circumstances not included in this specification.

Statement 3:

Unitedcells Co., Ltd. will inform the customers any improvement regarding the right handling of the battery.

1. Charge

1.1 Charge current: Max charge current: 5A

1.2 Charge voltage: The charge voltage should not exceed the Max. nominal voltage of 12.6V.

1.3 Charge temperature: The battery should be charged in a environmental temperature range from 0~45℃.

1.4 Use CC/CV charge mode. A reverse charging is forbidden. It will degrade the battery's charge/discharge performance and safety performance if been reverse charged. Also it will led to heating and leakage.

2. Discharge Current

The discharge current should not exceed 6A. A bigger current may led to the battery's capacity loss and heating.

3. Discharge Temperature

The battery should be discharged in a environmental temperature range from 10℃ ~ +60℃.

4. Over Discharge

An over discharge could degrade the battery's performance or loss of some functions. So a over discharge situation should be avoid. And the battery may be over discharged during a long term storage due to its self-discharge. In order to avoid such problems, the battery should be charged by a fixed interval to maintain a voltage of 10.8V~11.7V. Also it is required that the using battery devices should have a function which can prevent a ＜8.25V discharge situation.

5. Protection Circuit Module

5.1 The battery is equipped with a PCM, which could protect it from possible electrical damages.
1) Over charge protection: The battery will end charging automatically when reach the setting charge voltage;
2) Over discharge protection: The battery will end discharging automatically when reach the setting discharge voltage;
3) Over-current protection: the setting over-current value: 6~9A.

6. Storage

6.1 The battery should be stored at a clean, dry and windy indoor environment. The temperature should be in a range of -5℃～ +35℃, And the humidity should be 65 ± 20%;
6.2 Avoid touching corrosion material. And keep away from fire and heat source;
6.3 The battery should be stored with a voltage of 10.8V~11.7V. And be recharged at a 90 days interval if been stored for a long term.

7. Attentions

7.1 Handling Precautions

- Do not piece the battery with a nail or other sharp objects.
- Do not strike or throw the battery, or step on it.
- Do not directly solder the battery.
- Do not connect the positive (+) and negative (-) terminals with a metal object such as wire.
- Do not reverse the positive (+) and negative (-) terminals.
- Do not use or leave the battery near a heat source such as a fire or a heater (60℃ or higher).
- Do not use unspecified or none certification chargers to charge the battery.
- Do not use a battery which has been badly damaged in appearance or deformed.
- Do not carry or store the batteries together with necklaces, hairpins coins, nails or other metal objects.
- Do not use the battery any longer if there were situations such as heating, color-change, deformation, etc.
- Keep the battery out of children's reach to prevent any possible dangerous.
- Read this instruction carefully before using the battery.
- The battery should be charged, used and stored in a electrostatic free environment.
- A short-circuit should be avoid in any kinds of situations.

8. The Other Attentions

8.1 To disassemble the battery is not allowed in any kinds of situations as it will cause a inner short-circuit, and then cause further problems such as flame, getting on fire and the other safety problems.
8.2 Theoretically there is no Electrolyte existing in the battery. But if there is liquid comes out from it and touch your skin, eyes or some other body parts, please take the following instructions:
a. If the liquid touches the eyes, wash with clean water for at least 15 minutes. If still feel sick, go to the hospital and ask for professional advice.
b. If the liquid touches the skin, wash with big volume of clean water immediately.
c. If any gas emissions, change a place and get fresh air.
d. If eat the battery by mistake, go to the hospital immediately.

8.3 Do not discard the battery into fire or heat it.
8.4 Do not immerse the battery in water or seawater, etc.
8.5 Do not use damaged batteries.

9. Advised Using Instructions
9.1 Use the battery on pointed devices and instruments.
9.2 Use the battery in normal indoor environment; The temperature should be in a range of -5℃～+35℃, And the humidity should be 65 ± 20%;
9.3 Do not connect the positive (+) and negative (-) terminals with a metal object such as wire. Do not let the battery gets wet;
9.4 Treat the disposed battery properly, don't through it into fire or water.
9.5. Keep the battery far away from heat and children. Don't impact of hit it. Use the specified charger to charge it.

Special Attentions
Keep the battery in a half-charged statues if it will be stored for a long term. It means, don't full charge it or use up all the capacity in it. It should be full charged for every 2~3 months. And then used to half of its energy. Store it in a cool and dry place. This could ensure the battery's life-span performance.

§ 9. 2. Switching Power Supply Specifications

DESCRIPTION： 12.6V/3A CHARGER

1、SCOPE：

The purpose of the document is to specify the functional requirements of a 37.8W switching power supply.

2、INPUT CHARACTERISTICS：

2.1 Input Voltage:

Nominal Voltage:100-240Vac ， Variation Range:90-264Vac

2.2 Input Frequency:

Nominal Frequency:50/60Hz ， Variation Frequency:47-63Hz

2.3 Input Current:

0.5Arms max At any input voltage and rated, DC output rated load.

2.4 Inrush Current:

30Amps Max. Cold start at 240Vac input, with rated load and 25℃ambient.

2.5 Ac Leakage Current:

0. 25mA Max At 240Vac input.

3、OUTPUT CHARACTERISTICS：

3.1 Power Output：

Voltage	Min. Load	Max. Load	Peak	Output Power
+12.6Vdc	0A	3.0A	2.7-3.3A	37.8W

3.2 Combined Load/Line Regulation:

Voltage	Min. Voltage	Max. Voltage	Line Regulation	Load Regulation
+12.6Vdc	12.4V	12.8V	±3%	±5%

3.3Ripple And Noise:

The ripple and noise are as follows when measure with Max. Bandwidth of 20MHz and Parallel 47uF/0.1uF,crossed connected at testing point.

Voltage	Ripple And Noise(Max.)
+12.6Vdc	200mVp-p

3.4 Turn On Delay Time: 2 second Max. At 115Vac input and output Max. Load.

3.5 Rise Time:40mS Max. At 115Vac input and output Max. Load.

3.6 Hold Up Time: 5mS Min. At 115Vac input and output Max. Load.

3.7 Efficiency: 82%Min.At 100Vac input and output Max. Load.

84%Min.At 240Vac input and output Max. Load.

3.8 Overshoot: 15%Max.When power supply at turn on or turn off.

4、PROTECTION REQUIREMENT:

4.1 Short Circuit Protection:

The power supply will be auto recovered when short circuit faults remove.

4.2 Over current Protection：

The power supply will be auto recovered when over current faults remove.

4.3 Over Voltage Protection：

The power supply will not be auto recovered when faults remove.

5、ENVIRONMENTAL REQUIREMET:

5.1 Operating Temperature:

0℃~ -40℃, Full load Normal operation。

0℃to40℃,Full load Normal operation.

5.2 Storage Temperature:-20℃to85℃, With package.

5.3 Relative Humidity: 5%(0℃)～90%(40℃)RH,72Hrs,Full load Normal operating.

5.4 Vibration:

1、Operating: IEC 721-3-3 3M3

5～9Hz,A=1.5mm（9～200Hz,Acceleration 5m/s^2）

2、Transportation： IEC 721-3-2 2M2

5-9Hz，A=3.5mm

9～200Hz, Acceleration=5m/S^2

200～500HZ, Acceleration=15m/S^2

3、Axes,10 cycles per axis.

No permanent damage may occur during testing.

The product has to restors its original situation after power off/on.

5.5 Dropping/Packed:1 corner,3 edges, and 6 surfaces/ Height:76cm

6、SAFETY AND EMC REQUIREMENT:

6.1: SAFETY

6.2 DIELECTRIC STRENGTH：

(Primary to secondary)：1500Vac/5mA/60s.

7、MECHANICAL REQUIREMENT：

7.1 Enclosure:The power supply size L: L108*W48*H30mm

SIZE：108X48X30mm

§ 10. Guarantee and Contact Address

§ 10. 1. 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 in the following cases regardless of the guarantee period:

(1) Trouble or damage due to natural disaster.
(2) Trouble or damage due to abnormal voltage supply.
(3) Trouble or damage due to mishandling.
(4) Trouble or damage due to handling in disregard of the operating procedures or instructions described in the instruction manual.
(5) Consumable items(discharge electrodes etc.)

2. Before sending the splicer, Please consult nearest us first.
3. Necessary information for the repair.

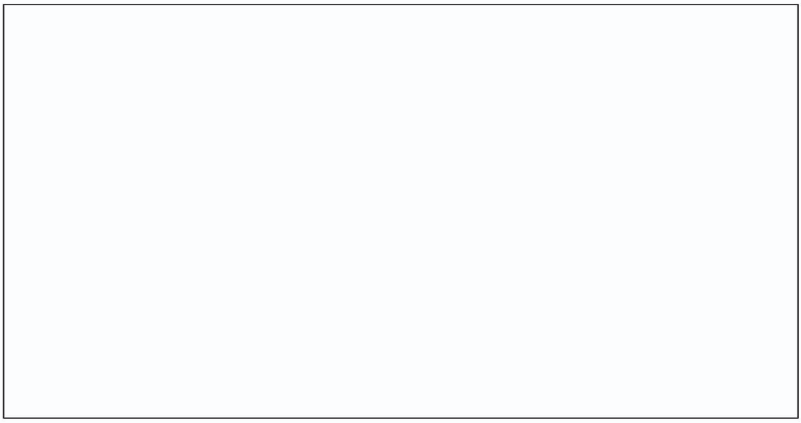
Attach papers to the splicer in order to inform us of details as described below.

(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) Encountered Trouble
- What state did your splicer get into and when?
- What is its present state?
- The state of the monitor and the contents of the relevant error message.

4. Transportation when sending the splicer, As the splicer is a high-precision machine, always use the attached carrying case for transportation and storage in order to protect it against humidity, vibration and shock. When you request us to repair the splicer, please send it together with its accessories.
5. Note for Repair

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

§ 10.2. Contact Address



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