

OPTICAL FIBRE FUSION SPLICER

SFS-002 User Manual



SFS-002 Optical Fibre Fusion Splicer

User Manual

SAFETY WARNING:

The incorrect use of the SFS-002 fusion splicer could lead serious injury.

1. Ensure that the correct Power Supply is used at all times to avoid damage to the SFS-002 Fusion Splicer.
2. Should any of the following faults become present in the SFS-002 Fusion Splicer turn the unit off immediately and disconnect the AC power supply from the wall outlet socket. Failing to do this could lead to irreparable damage to the unit and / or personal injury:
 - Smoke exiting from the machine
 - A Burning smell detected in the machine
 - Unfamiliar sounds / noise coming from the machine
 - Should excessive heat be detected in the machine
 - Should the machine become physically damaged
 - Should liquid or any other foreign matter be spilled on the machine
3. The SFS-002 Fusion Splicer does not have any user serviceable components and should therefore not be opened or disassembled unless done so by a qualified and authorized service agent. Any unauthorized work done on the unit will void the warranty of the unit with immediate effect.
4. The SFS002 Fusion Splicer should not be used in any environment where flammable liquid or gas is present as this could cause the unit to catch fire and result in damage to the unit as well as possible personal injury.

DISCLAIMER

- Space Television (Pty) Ltd does not accept any liability for damage caused to the SFS-002 Fusion Splicer by the use of a non-original battery or power supply unit.

No part of this manual may be copied, reproduced, transmitted, transcribed or translated into any language without permission. Space Television reserves the right to change the specifications of the hardware and software described in these manuals at any time. Space Television cannot be held liable for any damages resulting from the use of this product. Specifications are subject to change without notice.

© Space Television - 78 Republic Road, Ferndale, Randburg, 2125
PO Box 9317, Johannesburg 2000
T 0861 40 41 42
email sales@spacetv.co.za
www.spacetv.co.za

SFS-002 Optical Fibre Fusion Splicer

User Manual

CONTENTS:

1. BRIEF INTRODUCTION	2
1.1 Specifications	2
1.2 Configuration of fusion splicer	3
1.3 Parts Name of fusion splicer	4
1.4 Descriptions of the keyboard	5
2. BASIC OPERATION	6
2.1 Descriptions of the power modules	6
2.2 AC operation	6
2.3 Battery supply operation	7
2.4 Turn on and turn off	9
2.5 Display brightness control	9
2.6 Cover fibre protection sleeve	10
2.7 Preparation of fibre end-face	10
2.8 Place fibre	11
3. CHECK AND MAINTENANCE	12
3.1 Cleaning V-grooves	12
3.2 Cleaning Fibre Clamp Chips	12
3.3 Cleaning Wind Protector Mirrors	13
3.4 Cleaning Objective Lenses	13
3.5 Replace Electrodes	13
3.6 Set Calendar	14
4. CHANGE THE SPARE LITHIUM BATTERY PACK	15
5. POWER SUPPLY	15
Addendum A: Summary of Quick Operating	16
Addendum B: Guarantee Period and Limits	17
Addendum C: Contact Information	17

SFS-002 Optical Fibre Fusion Splicer

User Manual

1. BRIEF INTRODUCTION

The SFS-002 Fusion Splicer is imported and sold by Space Television (Pty) Ltd.

1.1 SPECIFICATIONS

Model	SFS-002 Fusion Splicer
Splicing Type	SM, MM, DS, NZDS
Splicing Loss	0.02dB(SM), 0.01dB(MM), 0.04dB(DS)
Return Loss	>60dB
Splicing Mode	Manual, Half Auto, Auto
Fibre Alignment	Core to Core Alignment by PAS technology
Applicable Fibre	Cable indoor and 0.25mm,0.9mm fibre, SC connector(option)
Splicing Time	≤9s
Heat Time	≤30s
Cleaved Length	8~16mm
Fibre Image/ Magnification	350/280
View Display	5-inch digital high-quality LCD screen
Tension Test	Standard 2N (option)
Heat Shrinkable Sleeve	60mm, 40mm and serials heat Shrinkable Sleeve
Battery Capacity	7200mAh, 3 hours charging time (splicing and charging at same time)
Battery Life	Cycling charge 300-500 times, easy to replace battery
Electrodes Life	3000 splices, easy to replace electrodes
Power Source	≤20W
Interface	USB Convenient data download and software update
Construction Lighting	Built in high brightness, wide range of lights, easy to operate at night
Power supply	Built in lithium battery 6800mAh 11.1V; External adapter, input: AC100-240V, output: DC13.5V/4.5A
Operating Condition	0-5000m above sea level, Temperature: -10~60°C, Humidity: 0 95%RH (No dew)
Weight (including battery)	1.98 KG (including battery)
Dimension (LxWxH)	135mm(L)×158mm(W)×155mm(H)

SFS-002 Optical Fibre Fusion Splicer

User Manual

1.2 CONFIGURATION OF FUSION SPLICER

Standard configurations of fusion splicer and accessories:

No.	Name	Quantity
1	SFS-002 Fusion Splicer	1 set
2	Fibre Cleaver	1 set
3	Fibre Stripper	1 pc
4	Power cord	1 pc
5	Li Battery	1 pc
6	Charger	1 pc
7	Cooling tray	1 pc
8	Spare Electrodes	1 pair
9	User Manual	1 pc

SFS-002 Optical Fibre Fusion Splicer

User Manual

1.3 SFS-002 FUSION SPLICER PARTS



Left Keyboard



Right Keyboard

SFS-002 Optical Fibre Fusion Splicer

User Manual

1.4 DESCRIPTIONS OF THE KEYBOARD

Membrane figure of left and right keyboards

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

SFS-002 Optical Fibre Fusion Splicer

User Manual

2. BASIC OPERATION:

The SFS-002 Fusion Splicer is capable of splicing various types of fibre optic cables. The compact size and light weight of the SFS-002 makes it ideal for use in any environment. The SFS-002 offers easy operation while ensuring that the minimum losses is achieved in every splice.



2.1 DESCRIPTIONS OF THE POWER MODULES

The SFS-002 Fusion Splicer uses 2 in 1 power module design, which allows for the splicer to be operated using the internal polymer lithium ion battery or the external AC power supply to provide power to the Splicer. When the SFS-002 is operated using the external AC power supply, the polymer lithium ion battery is charged at the same time. Always ensure that the correct battery, as specified by the manufacturer, is used in the SFS-002 Fusion Splicer.

2.2 AC OPERATION

- 2.2.1 When the AC power supply is used to power the SFS-002, it is important to always ensure that the correct power supply (as supplied by the manufacturer) is used to avoid damage to the splicer.

The parameters of the power adapter are as follows:

INPUT: AC 100-240V~1.8A 50/60HZ

OUTPUT: DC13.5V~5A

- 2.2.2 The SFS-002 AC power supply will not be able to provide a suitable DC output if the input AC voltage is lower than 100V or higher than 240V. Should the local AC supply not fall within the specified voltage limits, the AC power supply should not be connected to the SFS-002 Fusion Splicer as this could lead to severe damage to the unit.

- 2.2.3 When the SFS-002 Fusion Splicer is used while connected to the AC power supply, the internal polymer lithium ion battery will be charged while the splicer is in use. It is however recommended to leave the unit connected to the AC power supply, while not in use to ensure an efficient and complete charge cycle of the internal battery.

SFS-002 Optical Fibre Fusion Splicer

User Manual

2.3 BATTERY SUPPLY OPERATION

The SFS-002 Fusion Splicer may be used while powered by the internal polymer lithium battery in the splicer

2.3.1 Checking of battery capacity

While the SFS-002 Fusion Splicer is not connected to the AC power supply, press the "PUSH" button on the side of the power module. This will turn the battery capacity indicator lights on, indicating the remaining battery capacity. The number of the illuminated lights will indicate the current battery level .



When the SFS-002 Fusion Splicer is connected to the AC power supply and the internal battery is being charged, the battery capacity all the indicator lights will be illuminated. This will be an indication of the charger input current and not a battery level indication.

2.3.2 Battery charging

- <1> Every time the AC power adapter is connected to the SFS-002 the device will start the process of charging the internal battery. This will be done regardless of the current battery capacity.
- <2> During the charging process , the charging indicator (CHARGE) light will be illuminated in RED. Once the battery has been fully charged and the charging process has been completed the charging indicator (CHARGE) will be illumined in GREEN.
- <3> When the splicer is charged without being used, the charge time will vary between 40 minutes and 4 hours, depending the on the battery level when charging was started.
- <4> If the splicer is charged while being used, the charging time will be extended. It is always recommended to charge the unit while not in use to minimize the charging time and to ensure that the internal battery is charged to full capacity.

2.3 BATTERY SUPPLY OPERATION cont.

2.3.3 Under Voltage Alarm

The SFS-002 Fusion Splicer has been equipped with an “Under Voltage Alarm” function. If the capacity of the internal lithium battery is lower than the specified value (the default value around 10.3V), the splicer will automatically activate the alarm function. At this time the keyboard will be locked and the input disabled.

When the alarm is activated the user should immediately shut down the Splicer by holding down the “Power Switch” until the unit switches off. Once the AC power supply has been connected to the Splicer or the internal battery has been charged the Splicer can be used as normal.

2.3.4 The other considerations

- <1> Should your SFS-002 Fusion Splicer not be used for a month, or more, it is recommended that the internal battery be fully charged and then removed from the unit until the unit is being used.
- <2> The internal lithium battery should only be charged in ambient temperatures ranging between 0°C~40°C
- <3> Any rechargeable battery has a limited lifespan based on the recommended number of charge cycles it was designed for as indicated in the unit specifications in this document. When the operating time (number of splices) of the SFS-002 Fusion Splicer becomes limited, even after the internal battery has been fully charged, the battery will require replacing. Please ensure that the battery is replaced with the correct model as specified and supplied by the manufacturer.
- <4> Before using the SFS-002 Fusion Splicer powered by the internal battery, ensure that the internal battery has been sufficiently charged. Should the battery level indicator show a low battery level or the low voltage warning is given, the battery should be recharged before the Splicer is used.
- <5> Do not charge or discharge the internal battery in temperatures outside of the recommended operating temperature parameters to avoid damage to the battery or splicer.
- <6> The battery should be stored in a clean, dry and ventilated indoor environment of temperature ranging -5°C~35°C and humidity of 65±20%RH.

SFS-002 Optical Fibre Fusion Splicer

User Manual

2.4 TURN ON AND TURN OFF

TURN ON

Press  on the operator panel until the LED indicator lights turn from green to red, release the power button. When all of the motors return to the initial position, the screen shows the reset menu.

TURN OFF

Press  on the operator panel until the LED indicator turns from red to green, release the power button, now the machine is turned off.

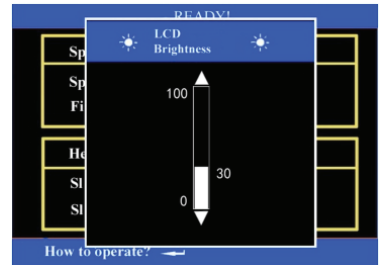


2.5 Display brightness control

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

- <1> Press  or  button in the "standby" operation interface to change the brightness of the display.
- <2> Press  to confirm the brightness changes, and return to "standby" operation interface.

When the display brightness is moderate, the capacity loss can be reduced, and the endurance of the battery can be prolonged.



SFS-002 Optical Fibre Fusion Splicer

User Manual

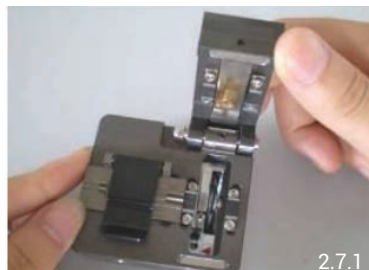
2.6 COVER FIBRE PROTECTION SLEEVE

The installation of fibre protection sleeve



2.7 PREPARATION OF FIBRE END-FACE

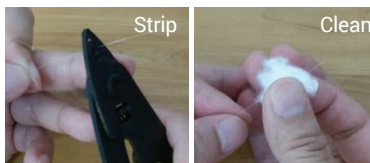
2.7.1 Open the big and small clips of the cutter; push the sliding plate installed with blade from the end to the front.



2.7.2 Use fibre stripping pliers to strip fibre coating layer, the length of which is 30-40 mm. Use gauze dipping with alcohol or wadding soft enough to wipe clean the fibre. Wiping with a clean cotton cloth once, and do not clean it with the same cloth for the second time.

(Notes: Please use the alcohol with purity more than 99 %.)

2.7.3 Aim the edge of the fibre coating layer at the "16" calibration of the cutter yardstick and put the fibre into orientation pressure tank with the left hand, and be sure that the bare fibre has been straightly put on the right and left rubber pads.



2.7.4 Close the small clip, big clip by right hand and promote sliding plate installed with blade to the other side, and then cut the fibre.



2.7.5 Hold the cutter by left hand and open the big clip by right hand and remove the fibre chips to put them in fixed containers.

2.7.6 Pinch and hold the fibre with the left hand, and open the small clip with the right hand at the same time, and carefully remove the fibre.

- Notes: The clean cross-section of fibre cannot touch other things.

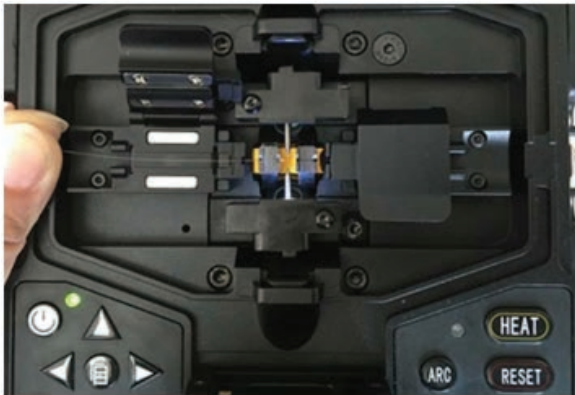


SFS-002 Optical Fibre Fusion Splicer

User Manual

2.8 PLACE FIBRE

- 2.8.1 Open shielding cover and left and right fibre clips.
- 2.8.2 Put the good fibre end face in the V-shaped groove; ensure the tip of the fibre between the tip of the electrode and V-shaped groove's edge.
 - * If the fibre is bending, bending part should be upward when placing the fibre.
 - * To ensure the splice quality of the fibre, the clean cross-section of fibre cannot touch other things.
- 2.8.3 Use fingers to pinch the fibre, and then close the left clip, and press the fibre. Ensure the fibre is placed in the bottom of V-shape groove. If the fibre is placed incorrect, please replace the fibre. The fibre end face don't touch the V-shape groove when place the fibre.
- 2.8.4 Place another optical fibre according to the above steps.
- 2.8.5 Close shielding cover



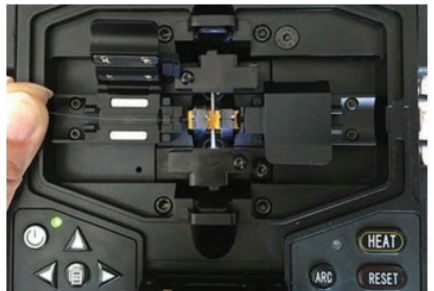
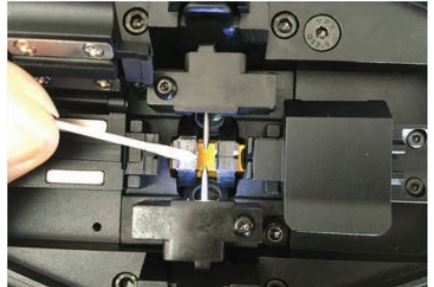
3. CHECK AND MAINTENANCE

Critical cleaning points and maintenance checks are described below.

3.1 CLEANING V-GROOVES

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

- <1> Open the wind protector.
 - <2> Clean the bottom of the V-groove With an alcohol-impregnated thin cotton swab. Remove excess alcohol from the V-groove with a clean dry swab.
- Be careful to not contact the electrode tips.
 - Do not use excessive force when cleaning the V-groove. The V-groove arm may get damaged.
 - If the contaminants in the V-groove cannot be removed with an alcohol-impregnated thin cotton swab, use a cleaved fibre end-face to dislodge contaminants from the bottom of the V-groove. Repeat step 2 after this procedure.



3.2 CLEANING FIBRE CLAMP CHIPS

- <1> If contaminants are present on the clamp chips, proper clamping may not occur, resulting in poor quality splices. The fibre clamp chips should be frequently inspected and periodically cleaned during normal operation.
- <2> To clean the clamp chips, do the following: Open the wind protector. Clean the surface of the chip clamp with an alcohol-impregnated thin cotton swab. Remove excess alcohol from the chip clamp with a clean dry swab.

SFS-002 Optical Fibre Fusion Splicer

User Manual

3.3 CLEANING WIND PROTECTOR MIRRORS

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

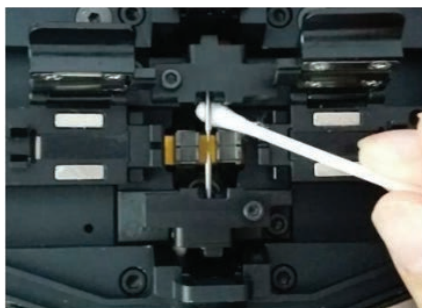


3.4 CLEANING OBJECTIVE LENSES

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

Cleaning Objective Lenses:

- <1> Before cleaning the objective lenses, always turn off the splicer.
Do not hit or touch tip of electrode when cleaning it.
- <2> Gently clean the surface of lenses (X-axis and Y-axis) with an alcohol-impregnated thin cotton swab. Using the cotton swab, start at the center of the lens and move the swab in a circular motion until you spiral out to the edge of the lens surface. Remove excess alcohol from the mirror surface with a clean dry swab. The lens surface should be clean and free of streaks or smudges.
- <3> Turn on the power and make sure no smudges or streaks are visible on the monitor screen. Press X/Y to change the screen and check the state of the lens surface on both the X- and Y-screens. Perform dust check.



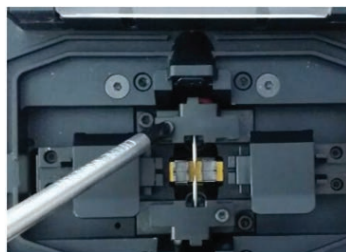
SFS-002 Optical Fibre Fusion Splicer

User Manual

3.5 REPLACE ELECTRODES

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

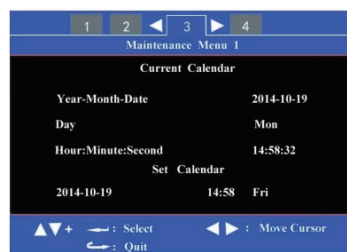
- <1> Press  button on the operator panel until the LED indicator turn from red to green, release the button, now the machine is turned off.
- <2> Remove the old electrodes and Method for tearing:
 - a. Loosen screw located on electrode cover.
 - b. Take electrode out of electrode cover.
(Electrode is fixed in the electrode cover)
- <3> Clean the new electrodes with alcohol-impregnated clean gauze or lint-free tissue and install them in the splicer.
- <4> Place the electrode cover and tighten screw.
 - Do not pull out night light wiring when replacing electrode.
 - The tightening of the screw should not exceed the strength of fingers.



3.6 SET CALENDAR

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

- <1> In the [Maintenance Menu], press  or  and move the cursor to select the [Calendar]
- <2> Press  to enter [Current Calendar] interface. Move the cursor to select the item to be changed. Press  or  to adjust the value.
- <3> After completion of calendar setting, press . The date and time are stored.



4. CHANGE THE SPARE LITHIUM BATTERY PACK

Change the spare battery according to the following procedures.

4. 1 Open the cover of the battery case Lean the Fusion Splicer; open the cover of the battery case which is at the bottom of the Fusion Splicer.
4. 2 Remove the old battery
Remove the lithium battery pack from the power module of the Fusion Splicer;
4. 3 Place new battery pack
Aligning the card slot, place new battery into the power module and make sure it is plugged in tightly, then close the cover of the battery case which is at the bottom of the Fusion Splicer.

5. POWER SUPPLY

Power does not turn off when pressing 

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

Few splices can be made with a fully charged battery pack

- The battery pack uses chemical reaction. The capacity decreases at low temperature, especially at lower than 0 degree.
- At high altitude, the arc discharge current is increased. In this condition, battery power degrades faster due to large power consumption.
- The AC/DC adapter is not the model supplied by the Company, or the charging time is not long enough.

“CHARGE” LED on AC adapter blinks during battery recharge

- Atmospheric temperature is too high (more than 50 degrees C), or the battery pack is charged under exposure to sunlight.
- The battery pack has a fault or has reached the end of its service life. Install a new battery pack. If the LED blinks again after install, contact your nearest sales agency.
- The AC/DC adapter is not the model supplied by the Company.

ADDENDA A: Summary of Quick Operating

I. PREPARING

1. Verify that the machine is plugged in power or the battery capacity is enough; then press  and hold the key until the machine is booted.
2. In the standby mode, press  to enter "Splice Menu" menu. Move the cursor to [Operation Options]; press  to enter. Set [Auto Start] [pause 1],[pause 2] respectively as "ON","OFF","OFF".
3. Discharge Calibration*
Discharge calibration is needed because constant changing of atmospheric conditions such as temperature and pressure, and the long service of the machine creates variability in the arc temperature and position.

Step of discharge calibration:

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

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

II. FIBRE PREPARATION:

1. Put the tube over one end of the fibre.
2. Use fibre stripping pliers to strip fibre coating layer, the length of which is 30-40 mm. Use gauze dipping with alcohol or wadding to wrap the fibre, and then clean the bare part.
3. Use a fibre cleaver to cut the fibre. Bare fibre length is 16 mm around.
4. Put the finished fibre in the Fusion Splicer. Cross-section of fibre can not touch other things.

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

IV. REINFORCE THE FUSION POINT.

1. Transfer fibre with protection sleeve from V-grooves to tube heater;
2. Make sure the splice point is located at the center of the protection sleeve.
Put the tube at the center of the heater.
3. Press  to start tube heating. The buzzer beeps and the HEAT LED turn off when tube heating is completed.
4. Remove the tube from the heater when the heater is cool. The whole process of Fusion Operation is completed.

V. REPEAT STEP II, III, IV TO CONTINUE SPLICING.

ADDENDA B: Guarantee Period and Limits

THE FOLLOWING IS NOT COVERED UNDER THE STANDARD PRODUCT WARRANTY:

- Should the SFS-002 Fusion Splicer malfunction or get damaged due to incorrect or inappropriate use. This includes, but is not limited to, physical damage, the unit being exposed to liquid or liquid entering the Splicer as well as short circuit of the battery or AC power supply.
- Should the Splicer be damaged due to natural disaster, including but not limited to, earthquakes, fires, floods, lightning, etc.
- Failure or damage due to use of non-original batteries and accessories
- Damage due to external factors such as voltage instability or power surges.
- Unauthorized disassembling or repairs of the unit
- Consumable parts (such as electrodes, cleaver blade, carrying case of fusion splicer, etc.) are not covered by the standard warranty.

ADDENDA C: Contact Information

Space Television (PTY) LTD
78 Republic Road,
Ferndale, Randburg, 2125
Tel: 0861 40 41 42
E-mail: technicalsupport@spacetv.co.za
Web: www.spacetv.co.za

SAFETY INSTRUCTIONS



Read these instructions carefully before connecting the unit



To prevent fire, short circuit or shock hazard:

- Do not expose the unit to rain or moisture.
- Install the unit in a dry location without infiltration or condensation of water.
- Do not expose it to dripping or splashing.
- Do not place objects filled with liquids, such as vases, on the apparatus.
- If any liquid should accidentally fall into the cabinet, disconnect the power plug.



To avoid any risk of overheating:

- Install the unit in a well aery location and keep a minimum distance of 15 cm around the apparatus for sufficient ventilation
- Do not place any items such as newspapers, table-cloths, curtains, on the unit that might cover the ventilation holes.
- Do not place any naked flame sources, such as lighted candles, on the apparatus
- Do not install the product in a dusty place
- Use the apparatus only in moderate climates (not in tropical climates)
- Respect the minimum and maximum temperature specifications



To avoid any risk of electrical shocks:

- Connect apparatus only to socket with protective earth connection.
- The mains plug shall remain readily operable.
- Pull out power plug to make the different connections of cables.
- To avoid electrical shock, do not open the housing of adapter.



Maintenance



Only use a dry soft cloth to clean.



Do not use solvent.



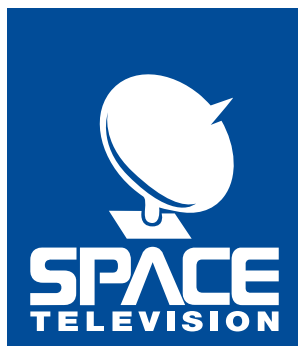
For repairing and servicing refer to qualified personnel.



Dispose according your local authority's recycling processes

User Manual

[illegible]



Helpline: 0861 40 41 42
WWW.SPACETV.CO.ZA