



Precision Rated Optics

Work with a PRO!

PRO-810

Fusion Splicer



Operation Guide

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1. Warnings and Cautions for Operation

The PRO-810 is used in different outdoor environment for fiber splicing, also known as field splicing. User must be aware that the arc fusion splicer may invoke some hazardous dangers.

- Read this manual carefully and completely before operating the splicer.
- Adhere to all safety instructions and warnings contained in this instruction manual.
- Retain this manual for future reference.

WARNING

- 1) Never operate the splicer in an environment where flammable liquids or vapors exist. The risk of dangerous fire or explosion may result from the electrical arc in such environments.
- 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 hands are wet. Possible electric shock may occur.
- 4) Do not operate the splicer if water condensation is present on surface of the splicer. Possible electric shock or equipment failure may result.
- 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, causing the unit to fall. Possible personal injury or equipment damage may result.
- 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, on the splicer. Otherwise, misalignment, discoloration, damage or deterioration may result.
- 9) The splicer requires no lubrication. 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 arc 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 or the power is supplied to the unit, the electrodes generate high voltage and high temperatures that may cause a severe shock or hand burns. Turn the splicer off, disconnect the AC power cord, and 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, electric shock or fire.
- 15) Use only the 176-264VAC, 47-63Hz/12VDC, 14Ah power supply with PRO-810. Using an improper AC power source may cause fuming, electric shock, equipment damage and may result in personal injury, death or fire.
- 16) Only use the supplied AC power cord. Do not place heavy objects on the AC power cord. Do not 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 injury, death or fire.
- 18) The PRO-810 uses a three-prong AC cord that contains an earthed ground safety mechanism. The splicer MUST be earth grounded. Use only the supplied three-prong AC power cord. NEVER use a two-prong power cord, extension cable or plug.
- 19) Use only the approved battery pack with the PRO-810. Only the PRO-810-01 battery pack can be used as the approved battery pack.
- 20) Use the specified charger cord (PRO-810-09) to recharge the battery pack (PRO-810-01). Use of another battery charger and/or charger cord may cause fuming or equipment damage and may result in personal injury, death or fire.
- 21) The splicer inline fuse is used to disconnect the power 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 and/or from the wall socket outlet immediately, if the splicer or the external battery emits fumes, emits a bad smell, 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 and/or from the wall socket outlet immediately, if the splicer becomes damaged (e.g., by dropping). Operating the splicer in a damaged state may cause equipment failure, electric shock or fire and may result in personal injury, death or fire.
- 24) Disconnect the AC or DC power cord from the splicer and/or from the wall socket outlet immediately, if liquids (e.g., water) or foreign matter (e.g., screw) lodges in the splicer. Operating 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. May cause severe hand burns.

26) Replacing the electrodes with the following guidelines:

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

If all the above instructions are not followed accordingly, the splicer may cause abnormal arc discharge and result in equipment damage or degradation in splicing performance.

27) The splicer must be repaired or adjusted by a qualified technician or engineer. If there is any doubt, please contact the nearest sales agent, before any incorrect repairs are performed which may cause fire or electrical shock.

2. Description

2.1 Specification

Note 1 : Mean splice loss:

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

Note 2 : Mean splicing time:

The length of time from when the start button is pressed to start the operation until the loss estimation is displayed on the screen.

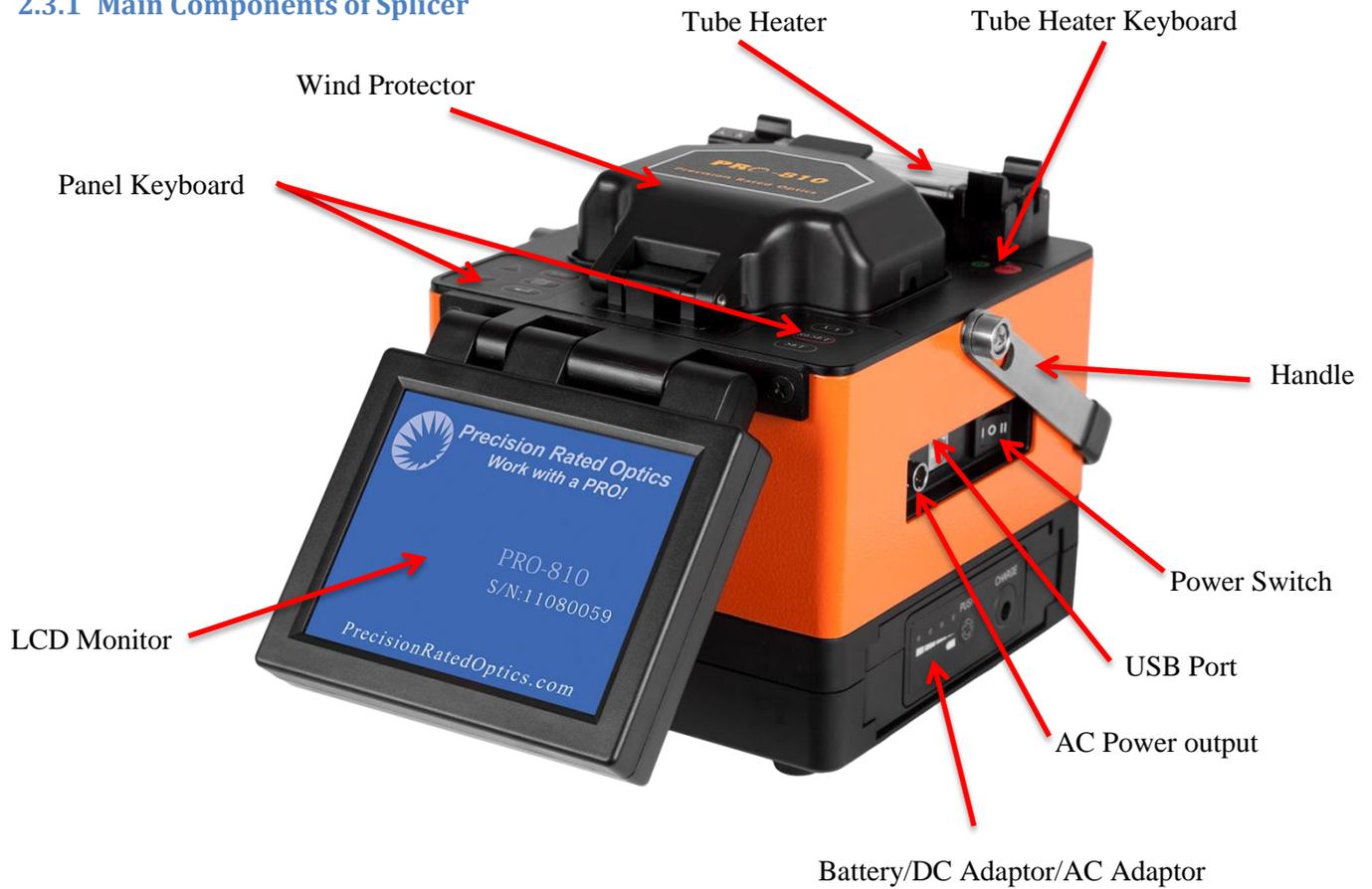
Note 3 : Fiber protection sleeve shrinking time:

The length of time from when the start button is pressed for the heating cycle to start; the red led will illuminate, until the end of heating cycle; the red led will turn off.

2.2 Components

2.3 Description and Function of Splicer

2.3.1 Main Components of Splicer



2.3.2 Panel Keyboards

Key	Name	Function
	Monitor View	X View only; Y View only Horizontal Split Monitor; Vertical Split Monitor
	Start	Start Splice Operation
	Reset	Splicer Reset
	Confirm	Enter
	Menu	Enter Main Menu, Confirm Menu
	Escape	Exit Menu
	Down	Menu: move cursor down, Manual: move fiber down
	Up	Menu: move cursor, Manual: move fiber up

Tube Heater Keyboard (Left)	
Key	Function
	Tube Heater On / Off
	Tube Heater "A"
Tube Heater Keyboard (Right)	
	Tube Heater On / Off
	Tube Heater "B"

2.3.3 Power Supply Switch and Plugs



3.Details of Splicing Operation

3.1 Three Power Sources

3.1.1 AC Power Source

Make sure the power source is 176~264VAC, 47~63Hz. When connecting to an AC Generator, always check the output voltage of the generator with a Voltage Meter before connecting the AC power cord (PRO-810-03).

Note: Make sure the AC Power Cord is free from damage.

Plug the AC Adapter (PRO-810-2) into the splicer. Plug the AC power cord into the AC Adapter Inlet Make sure the plug is fully seated in the AC Adapter Inlet. Plug the AC power cord into the wall socket. Make sure plug is fully seated. Press the Power Button, to turn on the splicer.

3.1.2 Internal Battery Pack

The Power Supply with an internal battery. Plug the Internal Battery into the splicer.

Note: Check that the Internal Battery is positioned properly.

Make sure the Internal Battery is fully seated in the splicer. Press the Power Button, to turn on the splicer.

3.1.3 External Battery Pack

Plug the DC Adapter in the splicer.

Note: Make sure the DC Power Cord is free from damage.

Plug one end of the DC Cord in the DC Adapter and other end of the DC Cord into external battery. Press the Power Button, to turn on the splicer.

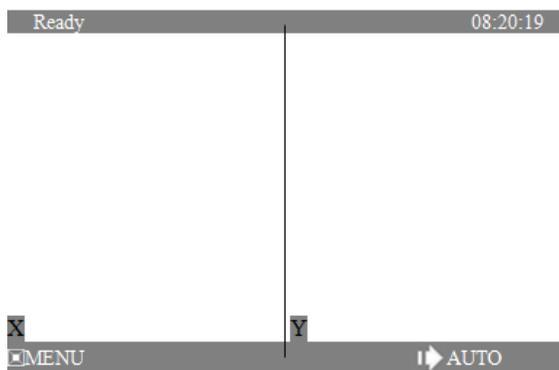
3.2 Applying Power to the Splicer

3.2.1 Power-On

Press the Power Button, to turn on the splicer and the READY Screen will be displayed.

3.2.2 The READY Screen

Currently selected mode: Auto



Note: If change working mode or fiber type, Press  for the setup menu.

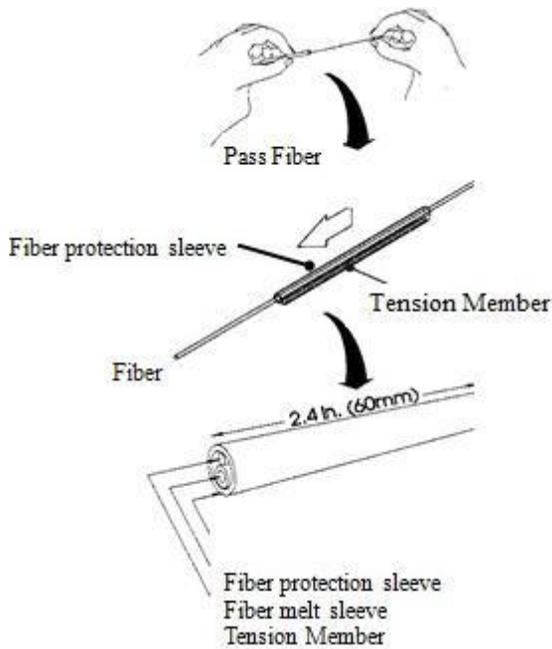
3.3 Fiber Preparation 3.3.1 Preparing the Fiber for Splicing

- 1) Clean the fiber outer coating approximately 100mm in length from the fiber end with a saturated alcohol lint-free tissue or gauze.
- 2) Pass the fiber through the fiber protection sleeve.
- 3) Remove the fiber coating 30-40mm with a stripping tool.
- 4) Clean the bare part with a new saturated alcohol lint-free tissue or gauze.
- 5) Cleave the fiber with a fiber cleaver.

Note: Cleave length : 16mm

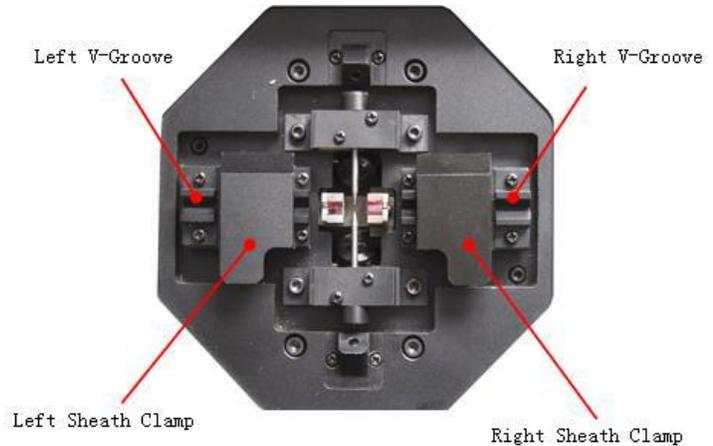
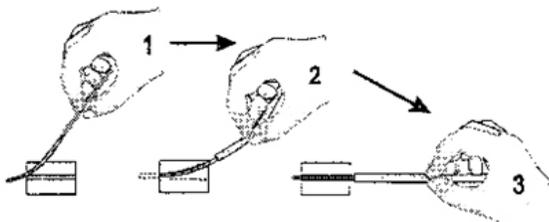
Note: Do not clean the fiber after cleaving.

Note: After cleaving the fiber, handle the fiber to not damage its bare glass.



3.4 Setting Fiber in Splicer

- 1) Open the Wind Protector.
- 2) Open the left and right Sheath Clamps.
- 3) Place Fiber in the V-Groove.



- 4) Gently close the Sheath Clamp while holding the Fiber.
- 5) Repeat steps for second Fiber.
- 6) Close the Wind Protector.

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

Note: 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 turn upward.

Note: 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.

Note: 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.

Note: 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.

3.5 Splicing Operation

The PRO-810 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 stages of the splicing process.

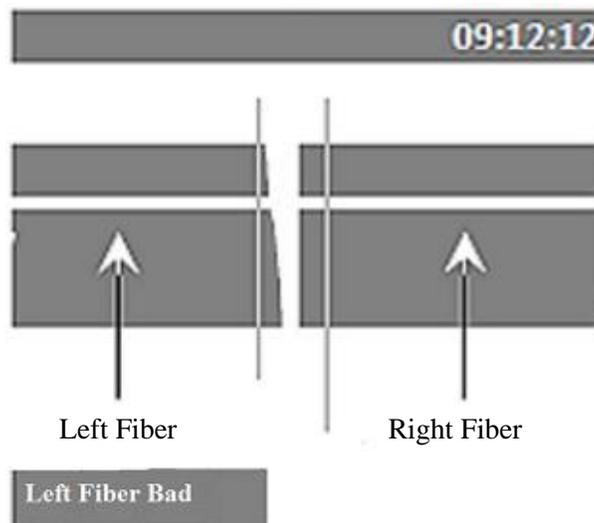
Start of splicing

Press the Set button to move the left and right fibers forward. After completion of cleaning the arc discharge, the fibers stop at the predetermined position.

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

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. When the threshold of cleave angle error is exceeded; an error message is displayed : “Left Cleave Bad” or “Right Cleave Bad”. If this occurs, re-cleave the fiber and start the process again.

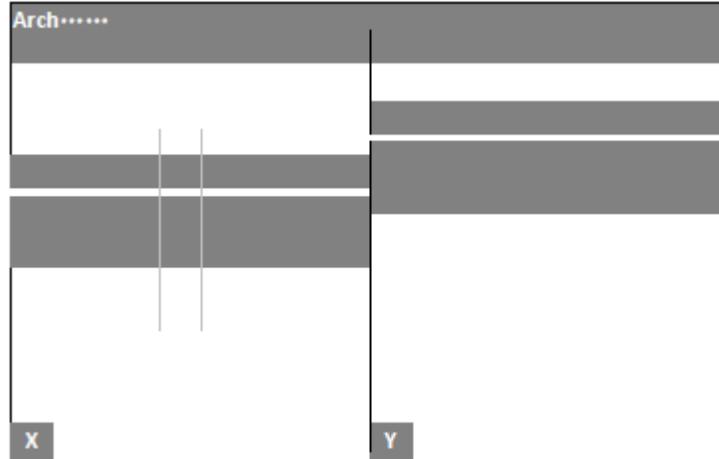


Note: If the following cases occur, even if there is no cleave angle error, press the reset button and repeat the fiber preparation step and start the process again.

Note: To change the threshold of cleave angle error; refer to Parameter Modification Section 5.5.

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 glass.



Note: 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.

Note: When the spliced state is abnormal, the splicer will display an error message, “Splice Fail”. A re-splice is necessary.

Splice Inspection

A slightly fat splice is normal. There is no problem with the splice loss and reliability. A white line or a black line will appear on the fiber’s joint with fluorine and titanium. Because of optics, there’s no effect to the joint.

Bubble



Flange



Thick Black line



Shadow



White Line OK



Faintness filament OK



Cladding off OK



Core off OK



Dust OK



Splice Loss Estimating

The estimated splice loss is displayed on the screen. In some cases the splice loss can be improved with the re-arc feature. Press the Set button to re-arc the splice.

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

Storing the Splice Results

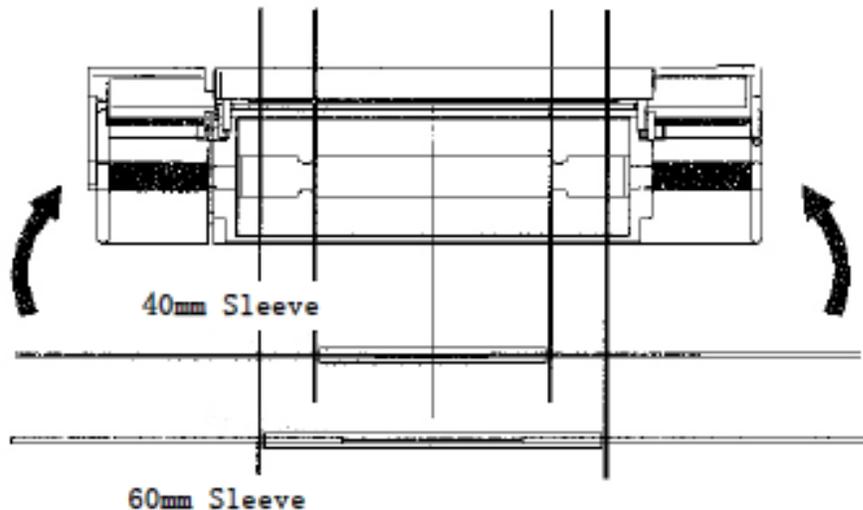
Press the Reset button or open the wind protector and the splicer will automatically perform the proof test and store the splice results in the memory CMOS chip. PRO-810 can store up to 4000 splice results. Refer to Fusion History Record section to access this file location.

3.6 Fiber Removal

- 1) Open the wind protector. Make sure the Tube Heater Clamps are open and ready to receive the fiber and the splice protector sleeve.
- 2) Open the left sheath clamp, while holding the left fiber in your hand.
- 3) Open the right sheath clamp, while holding the right fiber in your hand.
- 4) Remove the fiber from the splicer.

3.7 Reinforcing the Splice

- 1) Slide the fiber protection sleeve to the center of the splice and move it to the tube heater.
- 2) While applying tension to the fiber, lower the fiber in the Tube Heater. Make sure the reinforcing material is placed downward on the fiber protection sleeve. Check to see that the fiber is not twisted.
- 3) The left Heater Clamp will close automatically by touching the fiber to the arm of the Heater Clamp.
- 4) While tension is still applied to the fiber, close the right Heater Clamp with your left hand.



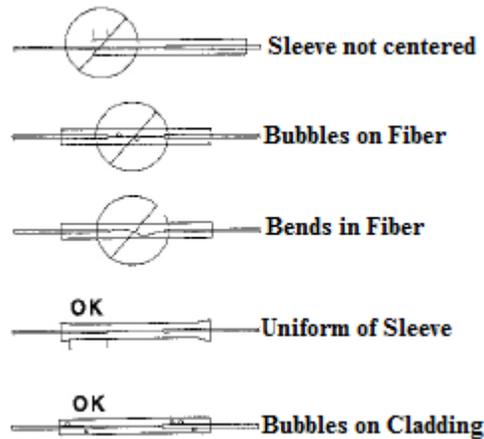
- 5) Press the Tube Heater On / Off Button to start the tube heating cycle. The Tube Heater LED will illuminate. Upon completion of the tube heating cycle, the Tube Heater LED will turn off.

Note: To abort the tube heating cycle, press the Tube Heater On / Off Button again.

- 6) Open the left and right Tube Heater Clamps. While applying tension to the fiber, gently remove the fiber.

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

- 7) Visually inspect the splice reinforcement for bubbles and impurities.



4. Maintenance of Splicer

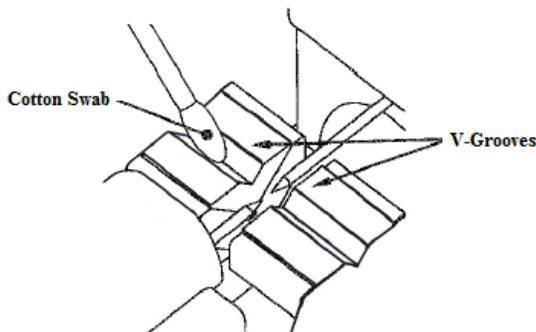
4.1 Maintenance and Inspection

Daily maintenance checks are described below.

4.1.1 Cleaning V-Grooves

If there are contaminants in the V-Grooves, proper clamping of the fiber may not occur, therefore resulting in a higher splice loss return. The V-Grooves should be frequently inspected and periodically cleaned during normal operation. The following steps will describe how to inspect and clean the V-Grooves:

- 1) Open the Wind Protector and the two Fiber Clamps.
- 2) Clean the bottom of the V-Groove with an alcohol-saturated thin cotton swab as shown in Fig. 4.1.1. Do not use excessive force when cleaning the V-Grooves. Remove excess alcohol from the V-Groove with a clean dry swab.



Note: Use care as to not come in contact with the electrode tips.

- 3) If contaminants in the V-Groove cannot be removed with an alcohol-saturated thin cotton swab, use a Cleaved Fiber End-Face to dislodge the contaminants from the V-Groove. Repeat step ② after this procedure.

4.1.2. Cleaning Fiber Clamp Chips

If contaminants are present on the Fiber Clamp Chips, correct clamping pressure may not occur, therefore resulting in a higher splice loss return. The Fiber Clamp Chips should be frequently inspected and periodically cleaned. Follow the Cleaning of the V-Grooves procedure for an accurate reference.

4.1.3. Cleaning Viewfinder

If the mirrors surface, located on the Wind Protector, becomes dirty, the core position may be incorrect due to decreased optical path clarity, therefore resulting in a higher splice loss return.

- 1) Clean the mirror surface with an alcohol-saturated thin cotton swab.
- 2) Remove excess alcohol from the mirror surface with a clean dry swab.
- 3) The mirror should be clean and smudge free.

4.1.4 Arc Test

Atmospheric conditions such as temperature, humidity, and pressure are constantly changing which create variability in the arc temperature. The splicer contains temperature, humidity, and pressure sensors that are used to constantly monitor the control system to regulate the arc power at a constant level. Changes in arc power due to electrode wear and glass adhesion cannot be corrected automatically. Therefore, the center position of arc discharge sometimes shifts to the left or right. Arc test according to the specific fusion program requested.

The user should time the operation to ensure a steady fusion quality. Using the Fusion Splicer if the following conditions exist, will require an Arc Test to be performed: In hot temperatures, cold temperature, low humidity, high humidity, deteriorated Electrode, different fiber, after maintenance, a new electrode installed, Or if all or a combination of several conditions are present.

- 1) Press the Menu button.
- 2) Press the Down Arrow button to select Arc Test.
- 3) Press the Enter button to start the Arc Test. Arc Test will automatically adjust the arc intensity. Repeat Arc Test until screen displays “Arc OK”.

After completing the Arc Test, press the Reset button to exit and return to a splicing state.

4.2 Periodical Maintenance

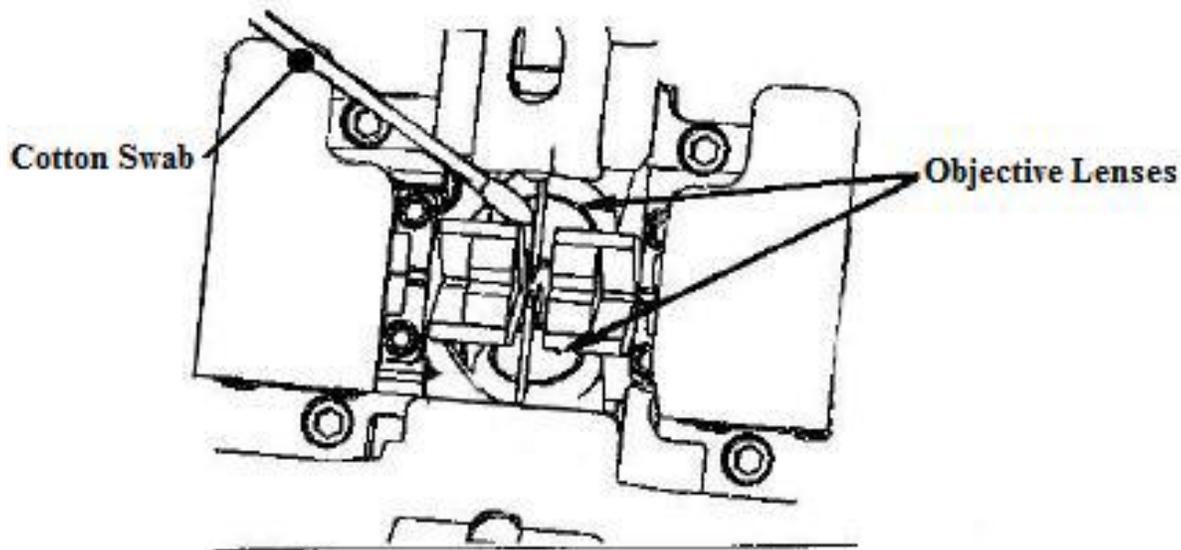
In order to maintain the splicing quality of the splicer, periodical inspection and maintenance are recommended.

4.2.1 Cleaning Objective Lenses

If the surfaces of the Objective Lenses become dirty, normal observation of the core position may be incorrect; this can result in a higher splice loss or a poor quality splice. Therefore, clean the Objective Lenses on a regular interval. Otherwise, dirt will accumulate making it impossible to remove.

- 1) Before cleaning the Objective Lenses, always turn off the Power Switch and disconnect the Power Cord to the splicer.
- 2) Remove the front and rear Electrode Covers.
- 3) Gently clean the Objective Lens surface with an alcohol-saturated thin cotton swab.
- 4) 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.
- 5) Remove excess alcohol from the mirror surface with a clean dry swab.
- 6) The Objective Lens surface should be clean and smudge free.
- 7) Reinstall the front and rear Electrode Covers.
- 8) Reconnect the Power Cord to the splicer and turn on the Power Switch while observing that there are no smudges or streaks visible on the Monitor Screen.

Note: Be careful not to bend the electrodes.



4.2.2 Electrode Replacement

Electrodes wear with use and must be cleaned periodically due to silica oxide buildup. It is recommended that the Electrodes be replaced when a message is prompted to replace the Electrodes is displayed immediately after turning on the power. Usually 2000 splices is the average life expectancy of a pair of electrodes. Using the Electrodes without a replacement will result in higher splice loss and reduced splice strength.

Replacement Procedure:

- 1) Exit the program after finishing the operation and turn off the power and disconnect the Power Cord from the splicer.
- 2) Remove the thumb screw on the Electrode Fixture Cover.
- 3) Remove the Electrode Fixture Cover and remove the Electrode.
- 4) Clean the new Electrode with alcohol-saturated clean gauze or lint free tissue.
- 5) Install the Electrode while leaving no gaps between the Electrode Collar and the Electrode Fixture.
- 6) Install the Electrode Cover and screw in the thumb screw, tightening the screw no more than finger tight.
- 7) Repeat steps through for the other Electrode.

When installation of the new Electrodes is completed, reconnect the Power Cord and turn on the power. Prepare and load fibers into the splicer.

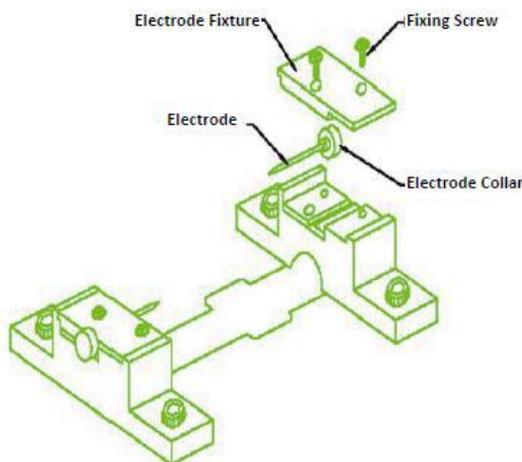
- 1) Press the Menu button.
- 2) Press the Down Arrow button to select Arc Test.
- 3) Press the Enter button to start the Arc Test. Arc Test will automatically adjust the arc intensity. Repeat Arc Test until screen displays “Arc OK”.

After completing the Arc Test, press the Reset button to exit and return to a splicing state.

Note: Use approved electrodes for PRO-810.

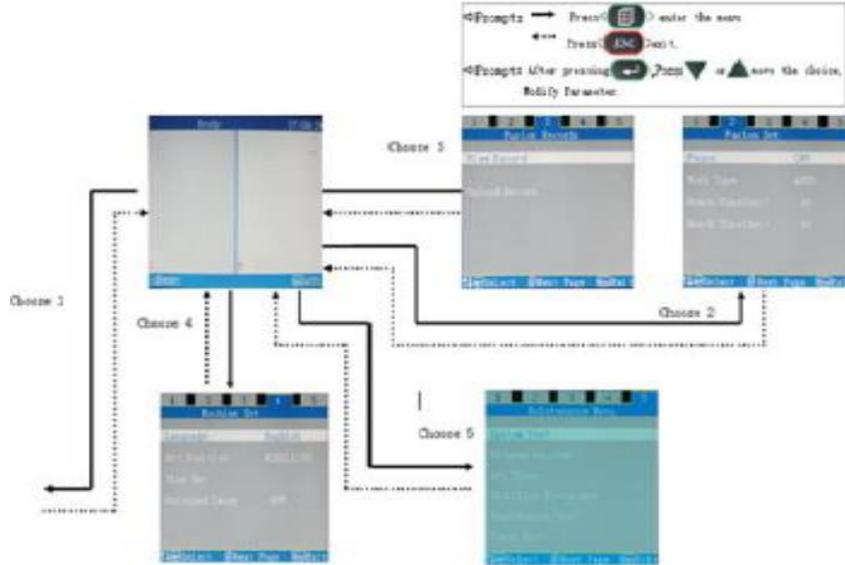
Note: Be careful not to damage the Electrode Shaft or tip when cleaning and / or installing in the splicer. Any damaged Electrodes should be discarded immediately.

Note: Incorrect installation of the Electrodes may result in greater splice loss or damage to the splicer.



5.Menu Commands

5.1 Menu Command Tree



5.2 Program Menu

5.2.1 Select Program

Select Program allows the operator to choice or compose a program. Press the Enter Button to select a Program under Program Menu based on the Fiber composition from the choices in the Select Program file. Move cursor to the fiber type by pressing the Up or Down Buttons to select appropriate Program. Press the Menu button to confirm that the Parameter Set values are accurate to the specific needs of the operation.

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: Different Fiber Type Programs should be selected to conform to the Fiber Type used in the operation. Do to specific parameters of varies Fiber Types, selection of the incorrect Fiber Type could result in a deformed Fiber Core. An error message may display “Splice Fail” or an estimated high Insertion Loss would conclude of a bad splice.

To select a specific Parameter to be modified, press the Up or Down Buttons to the appropriate Parameter. Press the Enter Button to modify that specific parameter. Press the Up or Down Buttons to the appropriate value. Press the Enter Button to update that specific parameter. Once the change is completed press the Escape Button to exit and save the modification.

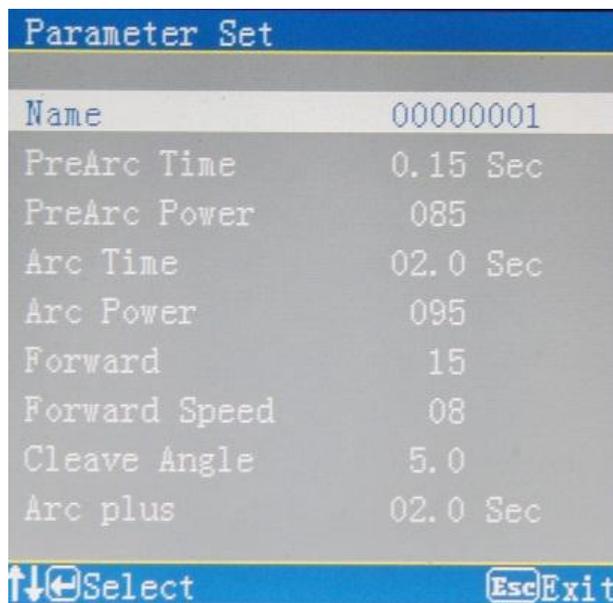
Press the Escape Button to exit the Parameter Set Menu.

Press the Escape Button to exit the Select Program Menu.

Press the Escape Button to exit the Program Menu and return to a working state of the splicer.

To compose a customized program, press the Up or Down Buttons to select a blank field and press the Menu Button to compose a program. Press the Enter Button on the Name setting and select a unique name for this program. Press the Up or Down Buttons to select a character in that column and press the Menu Button change columns. Press the Enter Button to select the choice of characters. Press the Escape Button to exit the Name Menu. Go through each Parameter until you are completed with the customized program. Refer to the When completed with the customized program, press the Escape Button to exit the Parameter Set Menu. Press the Escape Button to exit the Select Program Menu. Press the Escape Button to exit the Program Menu and return to a working state of the splicer.

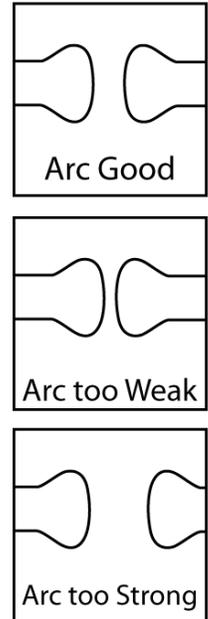
Function	Description	Value area
PreArc Time	Prefuse Time	0 – 1.00
PreArc Power	Prefuse Power	0 – 250.0
Arc Time	Fusion Arc Time	0 – 10.0
Arc Power	Fusion Arc Power	0 – 250.0
Forward	Fiber movement in distance (mm)	0 – 60.0
Forward Speed	Fiber movement in speed	1 – 10.0
Cleave Angle	Allowable Fiber angle on the end-face (degrees)	0 – 5.0
Arc Plus	Added time	0 – 25.0



5.2.2 Arc Test

Arc Test allows the operator to test the arc for adequate performance. Atmospheric conditions such as temperature, humidity, and pressure are constantly changing which create variability in the arc temperature. The splicer contains temperature, humidity, and pressure sensors that are used to constantly monitor the control system to regulate the arc power at a constant level. Changes in arc power due to electrode wear and glass adhesion cannot be corrected automatically. Therefore, the center position of arc discharge sometimes shifts to the left or right. Arc test according to the specific fusion program requested. The operator should time the operation to ensure a steady fusion quality. Using the Fusion Splicer if the following conditions exist, will require an Arc Test to be performed: In hot temperatures, cold temperature, low humidity, high humidity, deteriorated Electrode, different fiber, after maintenance, a new electrode installed, Or if all or a combination of several conditions are present.

- 1) Press the Menu button.
- 2) Press the Down Arrow button to select Arc Test.
- 3) Press the Enter button to start the Arc Test. Arc Test will automatically adjust the arc intensity. Repeat Arc Test until screen displays “Arc OK”. After completing the Arc Test, press the Reset button to exit and return to a working state of the splicer.



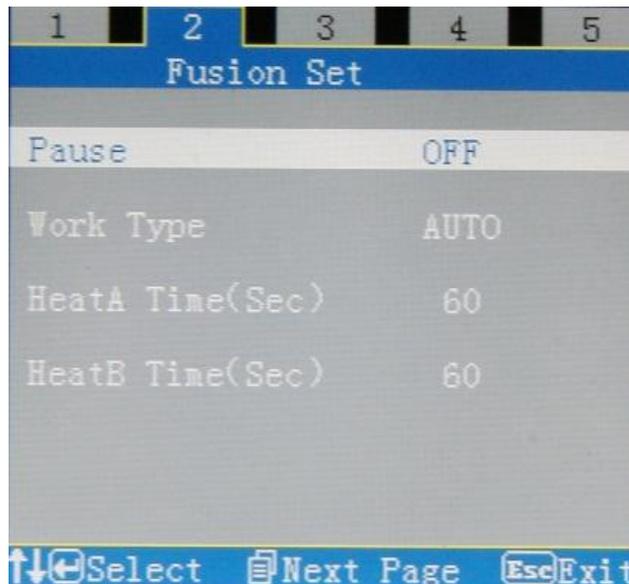
5.3 Fusion Set

Press the Menu button to change to the next page from the Program Menu to Fusion Set Programs.

5.3.1 Pause

The Pause feature allows the operator to start a function of the Operation, therefore after each step of the program there will be a pause in the program until the operator presses the Enter Button to start the next step of the program. On the Fusion Set page, this is how to change the state of Pause:

- 1) Select Pause and Press the Enter Button to change On / Off.



5.3.2 Work Type

There are three types of modes of Work Type; Auto, Full Auto, and Manual. When the process is completed for all modes, opening the Wind Protect will prompt the Tension Test to operate.

Auto Mode

Auto Mode allows the operator to start the process by pressing the Set Button after setting the fibers and closing the Wind Protect. The process will align the fibers, arc the fibers together and check for estimated insertion loss. This is the most commonly used mode.

Full Auto Mode

Full Auto Mode allows the operator to start the process by closing the Wind Protect, the process begins to align the fibers, arc the fibers together and check for estimated insertion loss.

Manual Mode

Manual mode allows the operator to manually perform each step of the operation by the operator pressing the Set Button. This mode does not display estimated insertion loss.

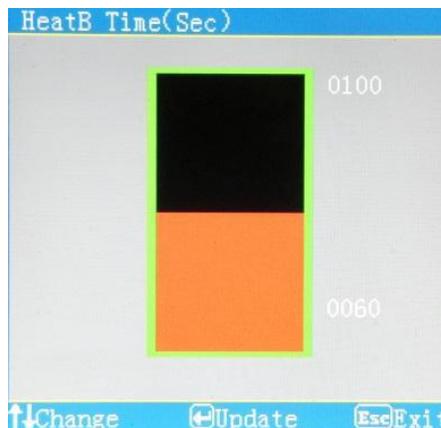
On the Fusion Set page, this is how to change the mode of Work Type:

- 1) Select Work Type and Press the Enter Button to prompt a drop down list.
- 2) Press the Down Arrow button to select Manual or Full Auto mode.
- 3) Press the Enter button to make selection.
- 4) Press the Escape Button to exit and return to a working state of the splicer.

5.3.3 Heater A

Heater A allows the operator to select the time in seconds how long Heater A will dispense heat. The values range from 0 – 100 seconds.

- 1) Select Heater A and Press the Enter Button to edit the values.
- 2) Press the Up or Down Buttons to change the values.
- 3) Press the Enter Button to update and save the change.



- 4) Press the Escape Button to exit and return to a working state of the splicer.

5.3.4 Heater B

Heater B allows the operator to select the time in seconds how long Heater B will dispense heat. The values range from 0 – 100 seconds.

- 1) Select Heater B and Press the Enter Button to edit the values.
- 2) Press the Up or Down Buttons to change the values.
- 3) Press the Enter Button to update and save the change.
- 4) Press the Escape Button to exit and return to a working state of the splicer.

5.4 Fusion Records

Press the Menu button to change to the next pages from the Program Menu to Fusion Record Programs.

5.4.1 View Record

View Record allows the operator to view a history log of all the fusion splice records in chronological order.

- 1) To view the next or previous record, press the Up or Down Buttons to change the records.
- 2) Press the Escape Button to exit the View record menu.
- 3) Press the Escape Button to exit and return to a working state of the splicer.

5.4.2 Upload Record

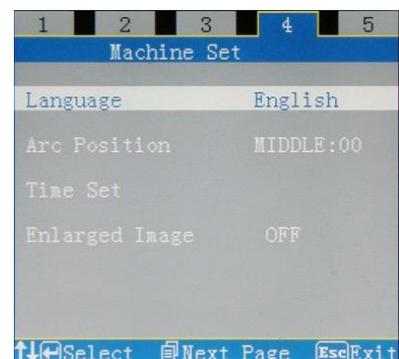
Upload Record allows the operator to view a history log of all the Fusion records and uploads the selected record to a PC through the USB serial port.

- 1) plug the USB cable from the PC to the Fusion Splicer.
- 2) Select Upload Record and press the Enter Button to view the Fusion Records.
- 3) Press the Up or Down Buttons to select the record to upload to the PC.
- 4) Press the Enter Button to upload the record to the PC.
- 5) Press the Escape Button to exit the Upload Record menu.

Press the Escape Button to exit and return to a working state of the splicer.

5.5 Machine Set

Press the Menu button to change to the next pages from the Program Menu to Machine Set Programs.



5.5.1 Language

The Language menu allows the operator to choose from the current choices of languages which are Chinese and English.

- 1) Select Language and press the Enter Button to view the choices of languages.
- 2) Press the Up or Down Buttons to select the language of choice.
- 3) Press the Enter Button to update and save the change of language.
- 4) Press the Escape Button to exit the language menu.
- 5) Press the Escape Button to exit and return to a working state of the splicer.

5.5.2 Arc Position

The Arc Position allows the operator to choose where the concentration of energy is focused on the fiber being fused. The most common position is the middle, so that the energy is equally distributed between the two end-faces of the fibers. Left and Right positions are 45° angle of concentration of energy allowing one fiber to have more energy than the other fiber. This is common when fusing two different fiber types, whereas one fiber core has a different melting point than the other fiber. There are three positions for the concentration of energy to be focused; Left, Middle, and Right.

- 1) Select Arc Position and press the Enter Button to view the Arc Position
- 2) Press the Up or Down Buttons to select the choice of Left, Middle, or Right.
- 3) Press the Enter Button to update and save the change of the position selected.
- 4) Press the Escape Button to exit the Arc Position menu.
- 5) Press the Escape Button to exit and return to a working state of the splicer.

5.5.3 Time Set

Time Set allows the operator to set the Year, Month, Day, Hour and Minute of the Fusion Splicer.

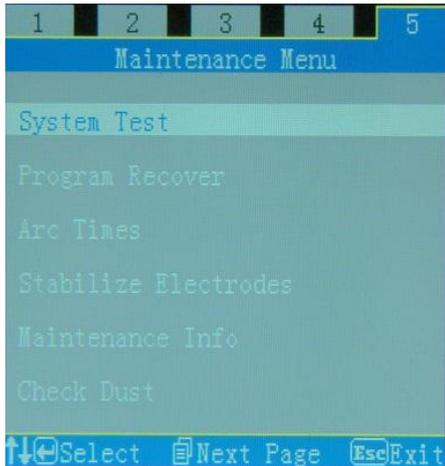
- 1) Select Time Set and press the Enter Button to edit the Date entered on the Fusion Splicer.
- 2) Press the Up or Down Buttons to change the year.
- 3) Press the Menu button to edit the month.
- 4) Press the Up or Down Buttons to change the month.
- 5) Press the Menu button to edit the date, which is the day of the month.
- 6) Press the Up or Down Buttons to change the date.
- 7) Press the Menu button to edit the hour.
- 8) Press the Up or Down Buttons to change the hour.
- 9) Press the Menu button to edit the minutes.
- 10) Press the Up or Down Buttons to change the minutes.
- 11) Press the Enter Button to update the entered edits. This will also exit the Time Set menu.
- 12) Press the Escape Button to exit and return to a working state of the splicer.

5.5.4 Enlarged Image

Allows the operator to view the fiber in a larger aspect.

5.6 Maintenance Menu

Press the Menu button to change to the next pages from the Program Menu to Maintenance Menu Programs.



5.6.1 System Test

System Test allows the operator to perform an automated diagnostic test on the system. The system test will check the Motors, LEDs, Camera, contrast, tilt angle, Splice Generator, and Sensors.

- 1) Select System Test and press the Enter Button to perform a System Test.
- 2) After completion of the System Test, Press the Escape Button to return to the Maintenance Menu page.
- 3) Press the Escape Button to exit and return to a working state of the splicer.

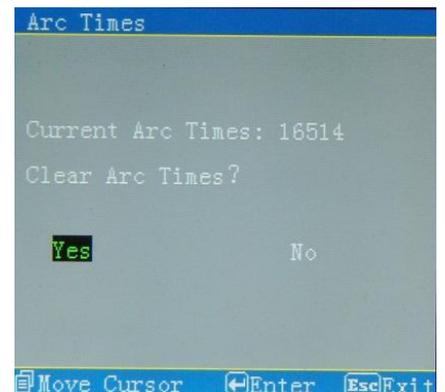
5.6.2 Program Recover

Allows the operator to recover a deleted program.

5.6.3 Arc Times

Arc Times allows the operator to view or reset the count of total arc count that is accumulated to date. This feature allows the operator to record and predict the life expectancy of the Electrodes.

- 1) Select Arc Times and press the Enter Button to view the current count of total arc count that is accumulated.
- 2) Press the Escape Button to return to the Maintenance Menu page.
- 3) If the operator would like to clear the counter and start with a new count, Press the Menu button to move the cursor to select 'Yes' or 'No'.
- 4) Press the Enter Button to update the current Arc counter.
- 5) Press the Escape Button to return to the Maintenance Menu page.
- 6) Press the Escape Button to exit and return to a working state of the splicer.



5.6.4 Stabilize Electrodes

Stabilize Electrodes allows the operator to perform an arc on the Electrodes to automatically center the arc. This utility is performed after the install of new Electrodes to burn off the impurities and residues. Any damaged Electrodes should be discarded immediately.

- 1) Select Stabilize Electrodes and press the Enter Button to perform the procedure.
- 2) Stabilize Electrodes Complete, Press the Escape Button to return to the Maintenance Menu page.
- 3) Press the Escape Button to exit and return to a working state of the splicer.

5.6.5 Maintenance Info

Maintenance Info allows the operator to obtain the Serial Number and the Version of firmware on the Fusion Splicer.

- 1) Select Maintenance Info and press the Enter Button to view the Serial Number and the Version of the Firmware on the Fusion Splicer.
- 2) Press the Escape Button to return to the Maintenance Menu page.
- 3) Press the Escape Button to exit and return to a working state of the splicer.

5.6.6 Check Dust

Check Dust allows the operator to perform a procedure to check for dust on the mirrors and the lenses. If dust appears, the display will direct the operator as to clean the appropriate surface. If dust check is good the display will read 'Dust Checked OK'.

- 1) Select Check Dust and press the Enter Button to perform the procedure.
- 2) Press the Escape Button to return to the Maintenance Menu page.
- 3) Press the Escape Button to exit and return to a working state of the splicer.

6. Error Messages

Error Message	Reason for Error	Solution
Left, Right or Both Cleaves Bad	Bad Fiber End-Face Dust or Dirt on Fiber End-Face Angle out of Tolerance	Check Condition of Fiber Cleaver; Clean V-Groove, Rotate Blade Re-Cleave Fiber End-Face Check the Tolerance of the End-face; View the current Program and check the Cleave Angle (Refer to 5.2.1 for editing)
Replace Left, Right or Both Fibers	Left Fiber is set too far back on the V-Groove Right Fiber is set too far back on the V-Groove Left and Right Fibers are set too far back on the V-Groove	Press the Reset Button and open the Wind Protector. Lift the Sheath Clamp and move the fibers forwards towards the Electrodes
Please close the Wind Protector	Unable to start the splicing process Wind Protector opened during the splicing process	The splicer automatically starts after closing the Wind Protector Press the Reset Button after closing the Wind Protector
Fusion Failure	The Pre-Fuse Power is too strong	View the current Program and check the Pre-Fuse Power setting (Refer to 5.2.1 for editing)
Left or Right Motor error	Motor Damage Power or Communication Plug loose Position Switch loose or damaged	Return to PRO for repair Check Plugs Check Position Switch

7. Troubleshooting

Restart the Fusion Splicer, if the issue persists, please contact PRO.

Precision Rated Optics
PO BOX 877
Trexlerstown, PA 18087
Phone: (888) 545-1254
Fax: (415) 358-4602
Email: Sales@FiberOpticPro.com

8. Transportation and Storage

8.1 Transportation Warnings

The Fusion Splicer is a precision machine which requires exact Adjustments, therefore excessive roughness could damage the equipment. Use the carrying case to transport and store the splicer will protect the equipment from becoming damaged. Do not set the Fusion Splicer on an unstable or lopsided surface. The equipment may become unbalanced and could cause injury or damage to the equipment.

8.2 Storage Precautions

Fusion splicer should be placed in the Carrying Case immediately after use. The Fusion Splicer is an exact and expensive instrument; therefore it should always be stored securely for safekeeping. It is advised to charge the battery once a month while not in use. Turn off the power before storage. Clean the following parts before storage; Pickup Camera, Lenses, Mirrors, Sheath Clamps and V-Grooves. Wipe off noticeable dust and debris from the equipment.

Note: Eliminate the liquid in the alcohol bottle before storing the bottle in the Carrying Case.

9. Warranty

If the splicer becomes in need of repair within one year from the date of delivery, PRO will repair it free of charge. However, note that repairs will be charged 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 supplied to the equipment.
- 3) Trouble or damage due to mishandling.
- 4) Trouble or damage due to handling in disregard of the operating procedures described in the instruction manual.
- 5) Consumable items (Electrodes etc.)

Please consult PRO and obtain an RMA before sending the Fusion Splicer for repair or Warrantee repair or replacement.

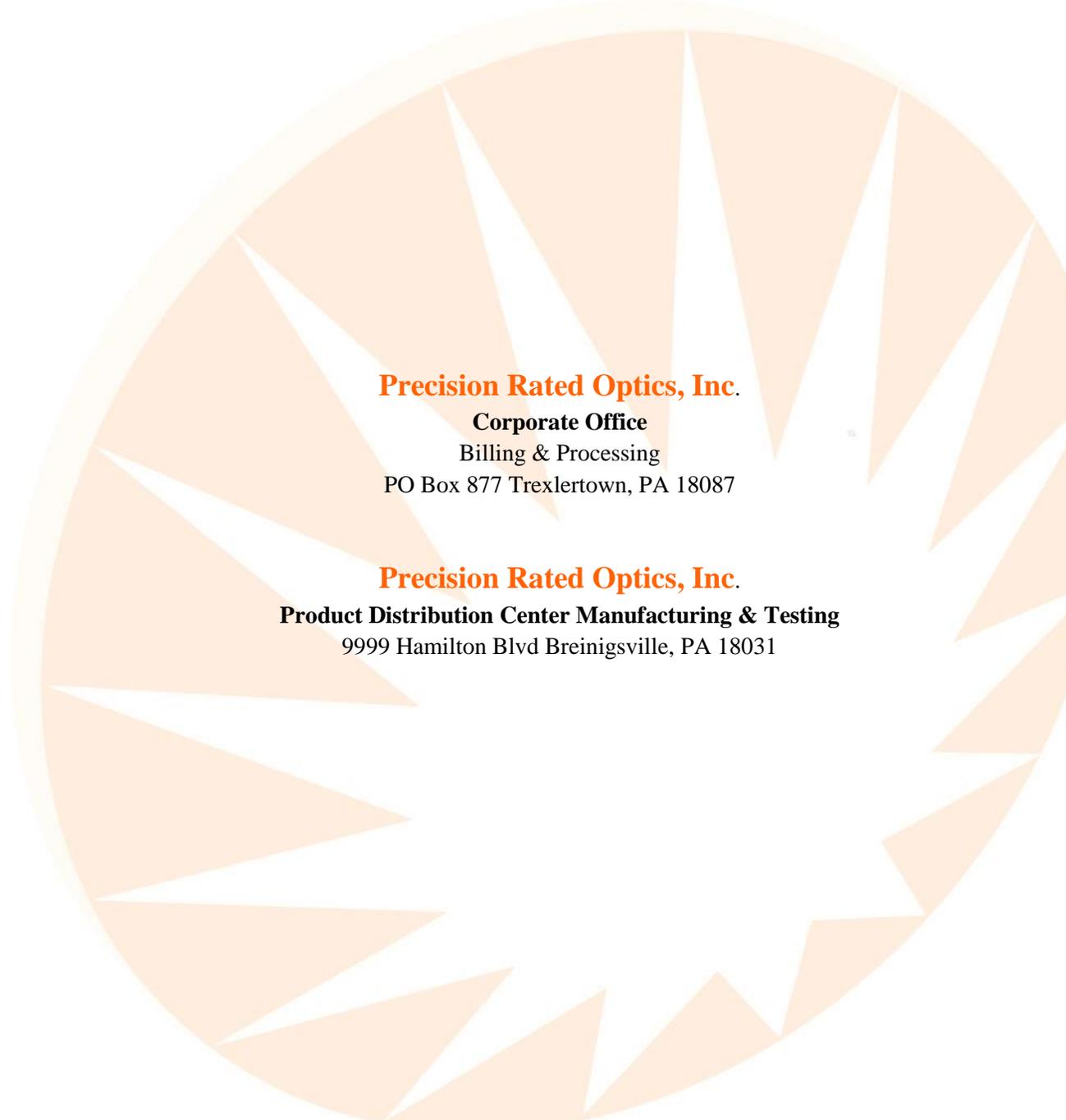
Please attach the following information to the Fusion Splicer in order to assure all aspects of the repair are addressed.

- 1) Full Name, Company, Section, Division, Address, Phone Number with Extension, Fax Number and Email Address.
- 2) Model Number and Serial Number of the Fusion Splicer.
- 3) Encountered Issues

When and how did the damages occur?

What is the current state of the Fusion Splicer?

What is the error message, if any?



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