Instruction Manual

Large Diameter Optical Fiber Cleaver

CT115/116

CT116: With Angled-Cleaving Unit

Fujikura

Thank you for purchasing Fujikura's Large Diameter Optical Fiber Cleaver.

Please 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.

There may be updates without notice.

Table of Contents

Safety Information

Thank you for purchasing Fujikura's Large Diameter Optical Fiber Cleaver
In this instruction manual, the processes and procedures are documented which should be observed in order to use this product safely.

This cleaver has been designed for cleaving glass optical fibers and capillary tubes. Cleaving should not be attempted on anything other than a glass optical fiber or a capillary tube with this product

Follow all safety instructions

Read and understand all safety instructions.

Stop using it when it malfunctions

Ask our service centers for repair as soon as possible.

Instruction Manual

Read this instruction manual carefully before operating the machine.

Store this instruction manual in a safe place.

The following symbols are used in this instruction manual to indicate warning and caution for safe use. Learn and understand the meanings of these symbols.

WARNING! / CAUTION!

There is a possibility of death, serious injury, or physical loss if this indication is ignored. Ignoring this indication is an improper use of the machine.

PAY ATTENTION!
In general, a yellow triangle means the associated caution should be observed.

Example:
PAY ATTENTION to hot surface! 

DO NOT …!

Example:
DO NOT disassemble! 

DO
A blue circle with a white graphic inside means the associated process is required for safe operation

Example:
You must disconnect the plug! 

WARNING / CAUTION

	*Disconnect the AC power cord from the AC adapter plug or the wall outlet immediately if a user observes the following:* *• Fumes, bad smell, noise, or over-heat occurs.* *• Liquid or foreign matter falls into this product.* *• The Cleaver or AC adapter is damaged or dropped.* *If any of these occur, contact our service center for repair. Leaving the cleaver or AC adapter in a damaged state may cause equipment failure, electric shock, or fire and may result in personal injury or death.*
	*The AC adapter supplied with this product is the only adapter approved for use with this product.* *Using an improper AC power source may cause equipment damage, fumes, electric shock, or fire and may result in personal injury or death.*
	*Do not disassemble or modify the cleaver or the AC adapter in any way. In particular, do not remove or bypass any electrical or mechanical device (e.g. a fuse or safety switch) incorporated into the design and manufacturing of this equipment. Modification could cause damage that may result in electric shock, fire, personal injury, or death,.*
	*Connect AC power cord properly to the AC Adapter and to the wall outlet. When inserting the AC plug, make sure there is no dust or dirt on the terminals. Insert the female plug into the AC Adapter and the male plug into the wall outlet until both plugs are fully seated. Incomplete engagement may cause fuming, electric shock, equipment damage, or fire and may result in personal injury or death. Disconnect the AC power cord when the cleaver is not being used.*
	*Use the supplied AC power cord. Do not place heavy objects on the AC power cord. Use of an improper or damaged cord may cause equipment failure, electric shock, or fire and may result in personal injury or death.*
	*Do not touch the cleaver, AC power cord and AC plugs with wet hands. This may result in electric shock.*
	*Do not operate the cleaver near hot objects, in hot environments, in dusty / humid environments, or when water condensation is present on the unit. This may result in electric shock, cleaver malfunction, or poor cleaving performance. When water condensation is present, leave the cleaver powered off and allow to air-dry at room temperature for at least 24 hours.*

WARNING / CAUTION

	Do not store the cleaver in any place where temperature and/or humidity are extremely high. Such environments may cause damage to the cleaver.
	Do not place the cleaver in an unstable or unbalanced position. The cleaver may shift or lose balance, causing it to fall. This may result in personal injury or equipment damage.
	The cleaver is a precisely adjusted and aligned instrument. Keep the unit away from strong mechanical shock or impact. Failure to do so will result in misalignent and lead to poor cleaving results. Use the supplied box for transportation and storage. The box will protect the cleaver from damage, moisture, vibration, and shock during storage and transportation.
	Always set the cleaver blade to the correct position in the machine. Setting the blade to an incorrect position may cause serious damage to the machine. *If the cleaver blade is replaced, only use the manufacturer-specified part. Failure to do so will result in serious damage to the machine.*
	The cleaver requires no lubrication. Adding oil or grease may degrade the cleaving performance and damage the cleaver.
	This equipment must be repaired or adjusted by a qualified technician or engineer. Incorrect repair may cause fire or electric shock. Please contact the authorized distributor if any problems occur on the machine.
	Keep the cleaver free of contaminants. They will degrade the cleave quality and may cause the machine to malfunction.
	Do not use the cleaver for anything other than cleaving optical fibers. Using it for any other purpose may damage the cleaver.

RECYCLING and DISPOSAL

In European Union

In accordance with the European Parliament Directive, electrical parts and materials that can be re-used and/or recycled have been identified in order that the use of new resources and the amount of waste going for landfill can be minimised.
In the European Union, do not discard this product as unsorted municipal waste. Contact your local authorities for further information.

In other countries

[Recycling]
To recycle this product, disassemble it first, sort each part separately by material components and follow your local recycling regulations.
[Disposal]
This product can be disposed of same as the standard electric poroducts. Follow your local disposal regulations.

Introduction

This cleaver (CT115/116) is for use with a single optical fiber.
In order to master the CT115 and CT116, read this instruction manual.

CT115

This model is applicable for cleaving up to 1250μm diameter fiber. The CT115 model does not have the angled cleaving unit.

CT116

This model is applicable for cleaving up to 1250μm diameter fiber.
Angled cleaving is available using the rotation unit.

Notes

LCD (Liquid Crystal Display) Monitor

The machine has an LCD monitor. The LCD is manufactured in a high quality-controlled factory environment; however, some black or red/green/blue dots may remain on the screen. The screen brightness may not appear uniform depending on viewing angle. Note that these symptoms are not defects, but are the nature of LCD screens.

Components

The items in the standard package are as follows. Please confirm that all items are included.

Standard Package List

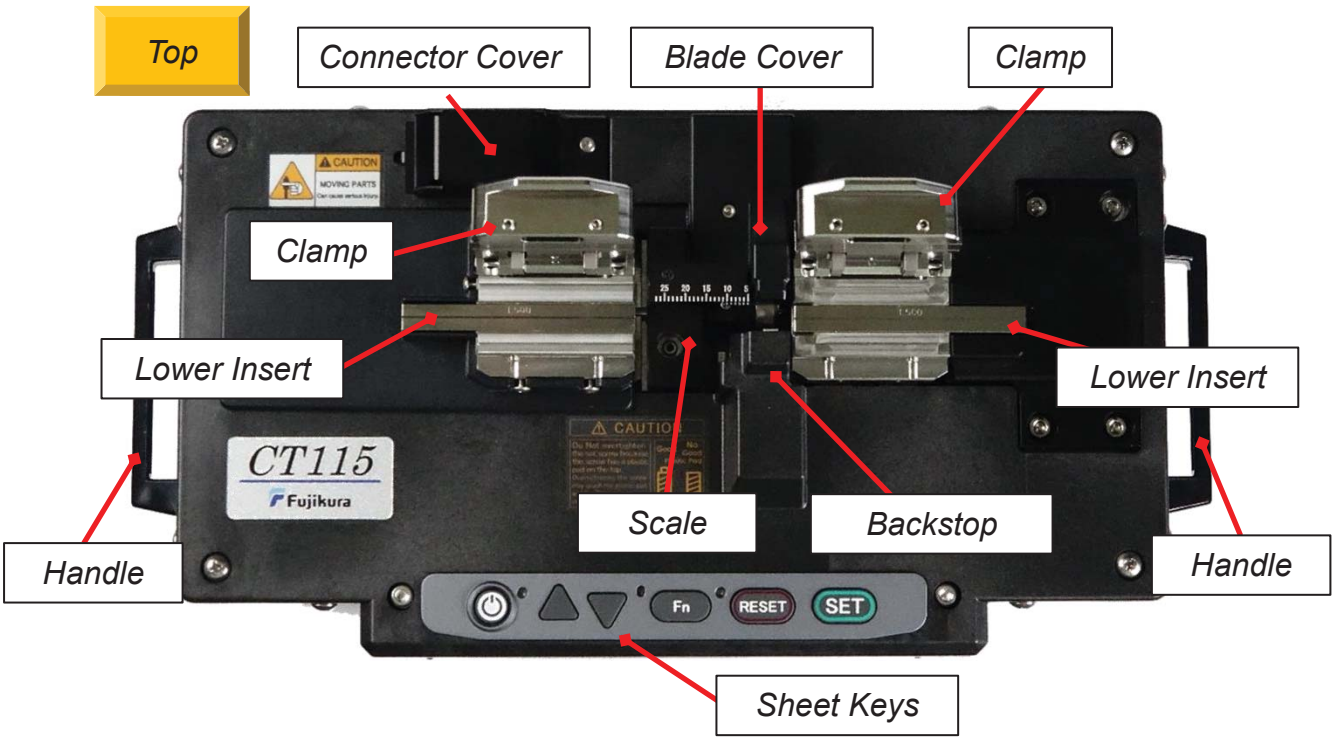
Model name: CT115	*Model name: CT116*
without angle cleaving unit [CT115] 	*with angle and rotating cleaving unit [CT116]* 

Name	*Item*	*Amount*
AC Adapter	*ADC-21*	*1pc*
AC Cord	*ACC-***	*1pc*
USB Cable	*USB-01*	*1pc*
Technical Reference	*TR-CT115-E*	*1pc*
Fiber holder adapter	*FHA-CT115*	*1pc*
Fiber height checking mirror	*CM-CT115*	*1pc*
Hexagonal Wrench	*HEX-01*	*1pc*
Height Adjusting Shim 30μm	*SPA-CT105-30*	*3pcs*
Height Adjusting Shim 50μm	*SPA-CT105-50*	*3pcs*
Height Adjusting Shim 100μm	*SPA-CT105-100*	*3pcs*
Screw for insert	*SCREW-CT-01*	*1set (15 pcs)*
Cleave test report	*CR-CT115*	*1pc*
Warning and Cautions	*WAC-04-E*	*1pc*

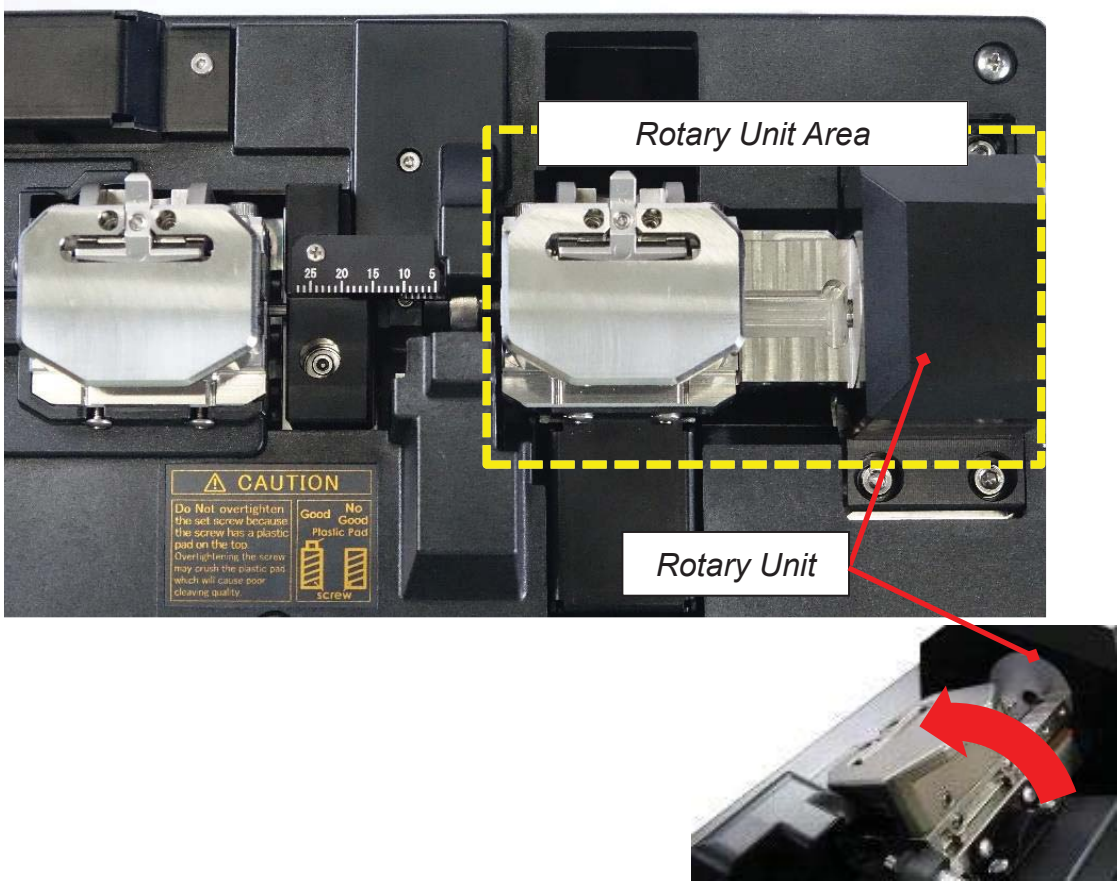
Additional Options List

Name	Item	Remarks
Lower Insert	*INSERT-L-80-02*	*54 to 107μm*
	INSERT-L-125-02	*84 to 167μm*
	INSERT-L-160-02	*107 to 213μm*
	INSERT-L-250-02	*167 to 333μm*
	INSERT-L-400-02	*267 to 533μm*
	INSERT-L-500-750-02	*500 side : 334 to 667μm*
		750 side : 634 to 1000μm
	INSERT-L-1000-1250-02	*1000 side : 884 to 1272μm*
		1250 side : 1120 to 1522μm
	INSERT-L-1500-1750-02	*1500 side : 1370 to 1772μm*
		1750 side : 1620 to 2015μm
	INSERT-L-2000-2250-02	*2000 side : 1870 to 2265μm*
		2250 side : 2114 to 2515μm
	INSERT-L-2500-3000-02	*2500 side : 2364 to 2848μm*
		3000 side : 2780 to 3182μm
Upper Insert	*INSERT-U-80-400-02*	*For 54 to 667μm*
	INSERT-U-500-750-02	*500 side : 400 to 868μm*
		750 side : 550 to 1118μm
	INSERT-U-1000-1250-02	*1000 side : 787 to 1355μm*
		1250 side : 1037 to 1605μm
	INSERT-U-1500-1750-02	*1500 side : 1287 to 1855μm*
		1750 side : 1537 to 2105μm
	INSERT-U-2000-2250-02	*2000 side : 1780 to 2348μm*
		2250 side : 2030 to 2598μm
	INSERT-U-2500-3000-02	*500 side : 400 to 868μm*
		750 side : 550 to 1118μm
Height Adjusting Shim Set (10 sheets each)	*SPA-CT105-30*	*For Adjustment Clamp Height Thickness: 30μm*
	SPA-CT105-50	*For Adjustment Clamp Height Thickness: 50μm*
	SPA-CT105-100	*For Adjustment Clamp Height Thickness: 100μm*
Cleaving Blade	*CB-06A*	*Replacement blade*
Fiber Holder	*FH110-****	*Each Sizes*
Insert set 80-1750 μm	*INSERT-SET-80-1750*	*INSERT-L-80 : 2pcs*
		INSERT-L-125 : 2 pcs
		INSERT-L-160 : 2 pcs
		INSERT-L-250 : 2 pcs
		INSERT-L-400 : 2 pcs
		INSERT-L-500-750 : 2 pcs
		INSERT-L-1000-1250 : 2 pcs
		INSERT-L-1500-1750 : 2 pcs
		INSERT-U-80-400 : 2 pcs
		INSERT-U-500-750 : 2 pcs
		INSERT-U-1000-1250 : 2 pcs
		INSERT-U-1500-1750 : 2 pcs

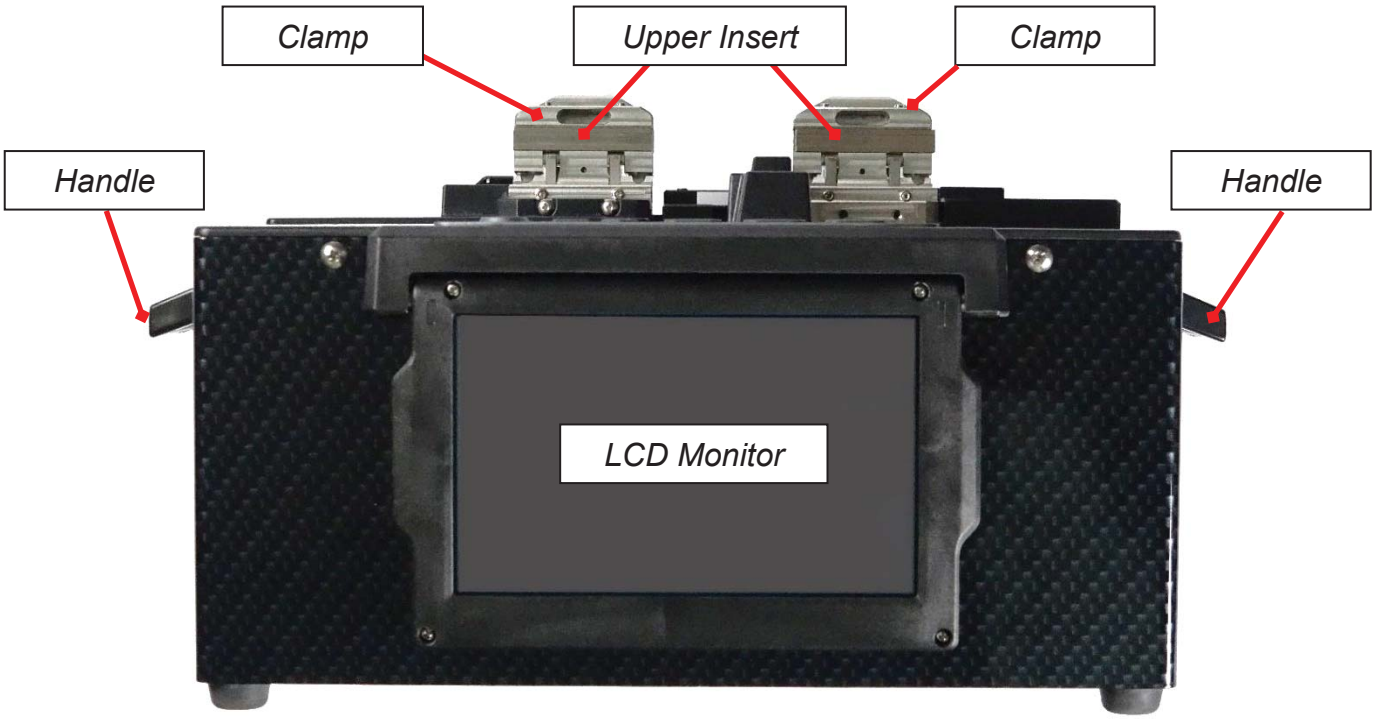
Description of Cleaver



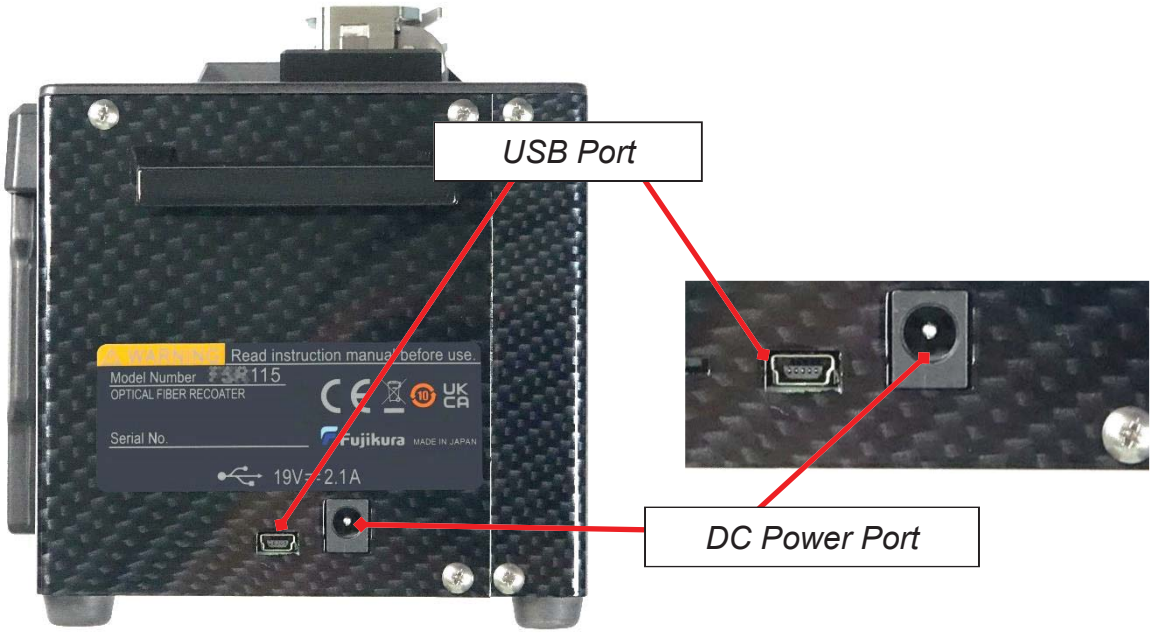
CT116



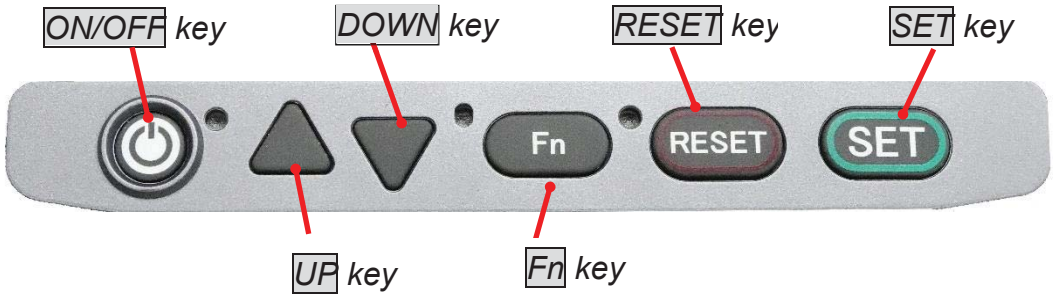
Front


Clamp
Upper Insert
Clamp
Handle
Handle
LCD Monitor

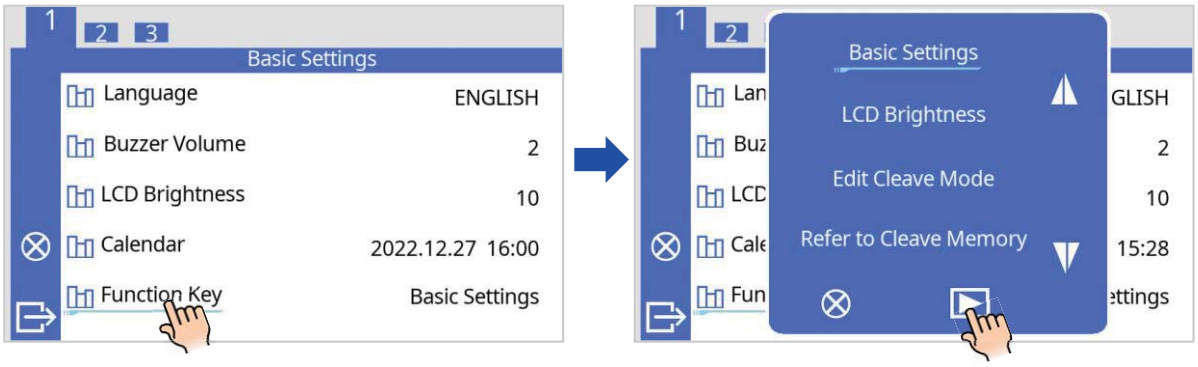
Right


USB Port
DC Power Port
Read instruction manual before use.
Model Number
115
OPTICAL FIBER RECOATER
Serial No.
Fujikura
MADE IN JAPAN
19V
2.1A

Functions and Names of Sheet Keys



Key Name	Key Function
ON/OFF Power	Turns the power on and off.
UP key	Adjusts the brightness of the screen by pressing the UP key at the [READY] screen. Moves the cursor for selecting an item in the menu. Changes the value or letter of Mode Title.
DOWN key	Goes to the [Cleave Menu] screen by pressing DOWN key at the [RESET] or [READY] screen. Moves the cursor for selecting an item in the menu. Changes the value or the letter of Mode Title.
Fn (Function) key	By default, [Basic settings] is linked to this key in the Menu screen. Pressing this key will pause the cleaving procedure.
RESET Reset key	Returns to the initial state from any other state. After pressing this key, the buzzer sounds and motors start the reset motion. During the reset motion, “Reset …” is indicated. After the reset motion, [READY] or [RESET] screen is shown on the monitor.
SET Set key	Starts the cleaving operation. Wakes machine from the sleep state.

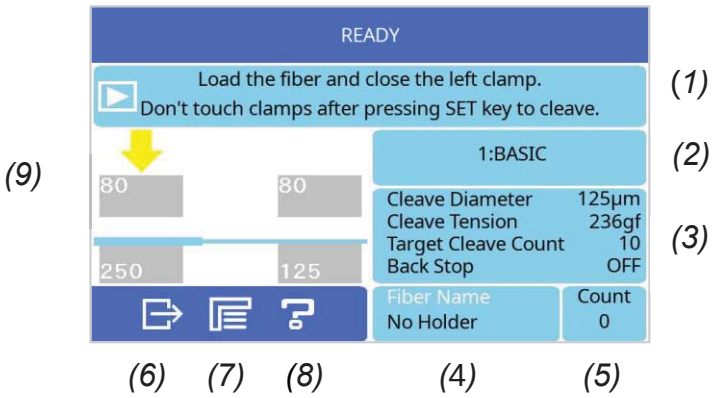


The Fn key can be assigned to any of the shortcuts listed under “Function Key” in “Basic Settings.”

Touchscreen Operation and Function

This product has a touchscreen monitor. The operator can select or change settings by touching the icons on the monitor.

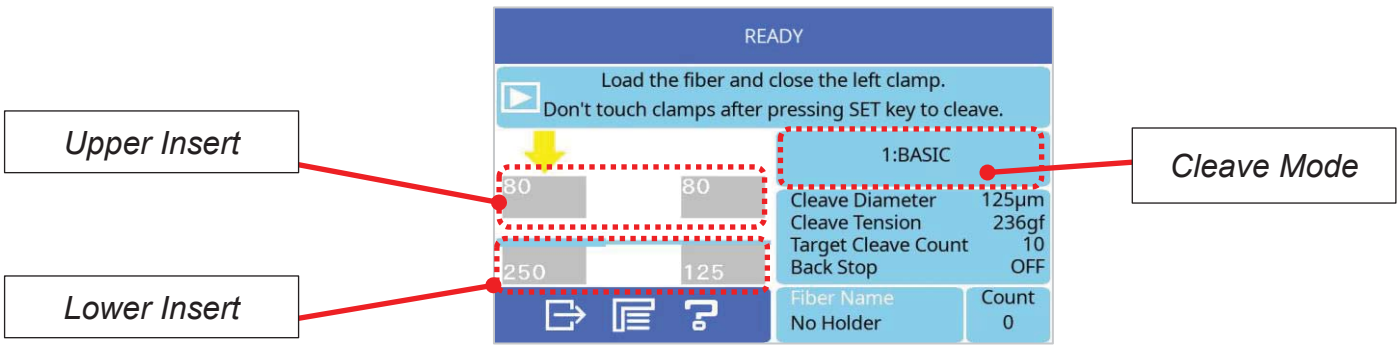
The icons on the [READY] screen and their functions are as follows:



No.	Function
(1)	Displays the cleaving procedure. Follow instructions shown.
(2)	Displays the current cleave mode. Touch this icon to go to the [Select Cleave Mode] menu.
(3)	Displays the current cleave conditions. Touch this icon to go to the [Fundamental Settings] menu.
(4)	Displays Fiber Holder size. Touch this icon to go to the [Fiber Holder Management] menu. If the Fiber Holder Adapter is not installed, this icon will go to the [Fiber Holder Adapter Installation] page.
(5)	Displays the number of cleaves that have been done with the current blade. Touch this icon to go to the [Blade Management] screen.
(6)	Touch this icon to pause the cleaving procedure.
(7)	Touch this icon to go to the [Cleave Menu].
(8)	Touch this icon to go to the [General Information] page. The operator can find the built-in manual here.
(9)	Displays the optimal insert sizes for the selected cleave mode. Make sure that the installed insert sizes and the displayed sizes are the same.

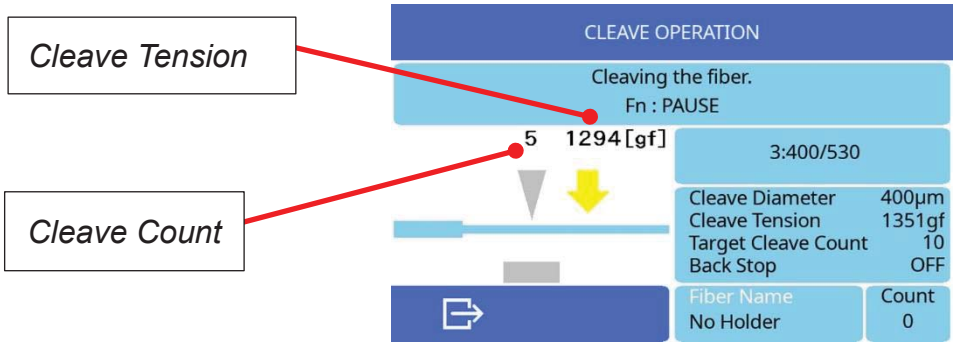
Touchscreen Operation and Composition

[READY] Screen



Icon	Description
Cleave Mode	The current cleave mode is displayed. Make sure that the selected cleave mode is appropriate for the optical fiber in use.
Upper / Lower Insert	The required insert sizes for the selected cleave mode are displayed. Make sure the installed insert sizes and the displayed insert sizes are the same.

Cleave Operation



Item	Description
Cleave Tension	Tension applied during the cleaving process. Cleave tension can be changed in the [Cleave Tension] section of the cleave mode under [Tension Settings].
Target Cleave Count	Displays the target number of blade oscillations for cleaving the fiber. Cleave count can be edited in the [Target Cleave Count] part of the cleave mode under [Blade Settings].

Pressing the Fn key pauses the cleaving procedure. It is possible to change the cleave tension by pressing the SET key at the paused state.

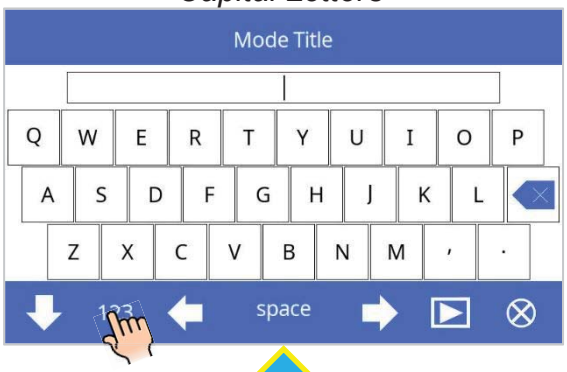
How to Input Mode Title/Comment/Password

Characters listed below are shown at the [Mode Title/Comments/Password] input menu.

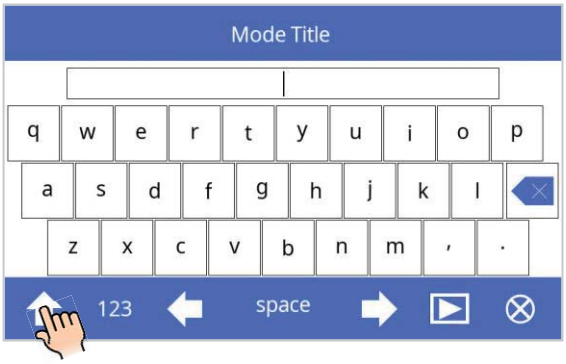
1. *Touch the keyboard to type the text you wish to input. Use the*  *icons to move the position of the cursor.*
   If you mistype, touch the  *icon to delete text. The text you entered is shown in the window above the keyboard.*

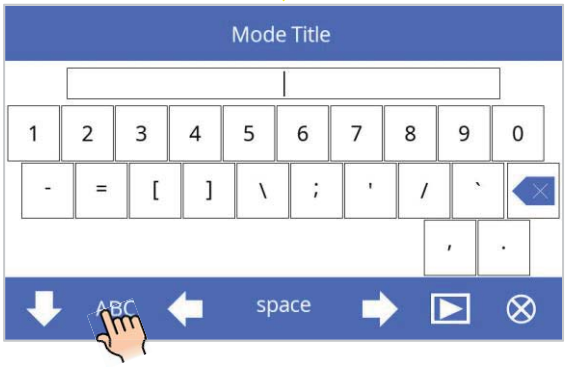
2. *After typing, press the*  *icon.*
   After the [Enter Password] screen, if the password is correct, the cleaver will show the next menu. If the password is incorrect, the cleaver will show the previous screen.

Capital Letters

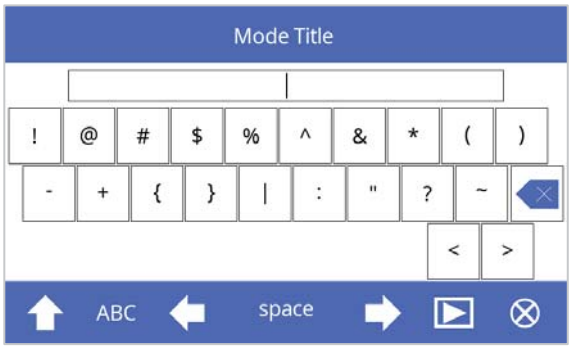


Lower Case Letters





Numbers



Symbols

How to Install the Inserts

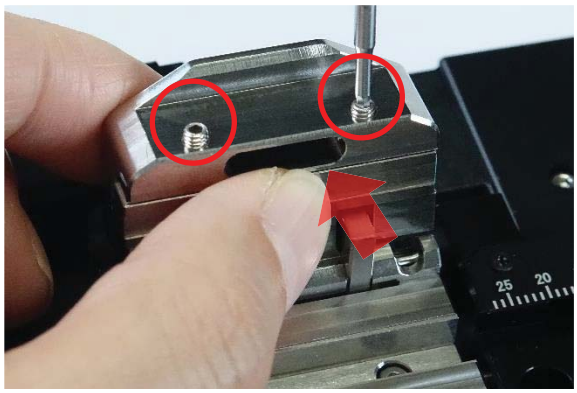
Select the inserts according to the cladding diameter and the coating diameter of the optical fiber being cleaved. The coating-side of the optical fiber will be held by the left clamp unit, and the bare, cladding-side of the optical fiber will be held by the right clamp unit.

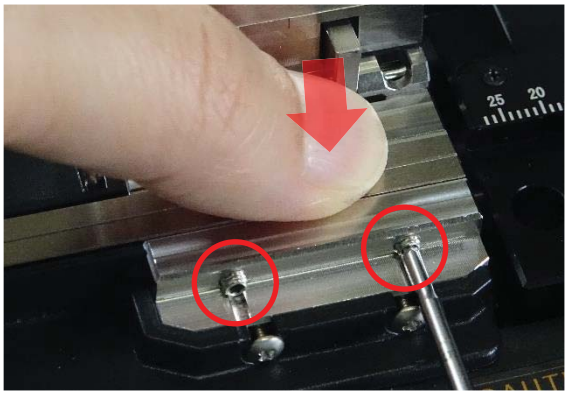
Upper Insert

Install the upper inserts so that the end-face of each insert aligns with the side of the upper clamp facing the blade (toward the center of the machine). Install the upper inserts before installing the lower inserts.

Confirm the end face is aligned to the edge

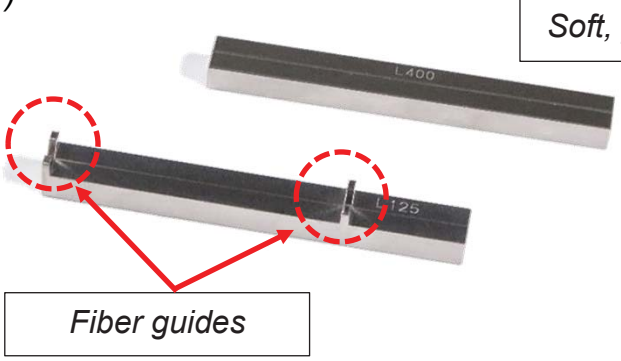
Tighten the screws with the attached hex wrench (HEX-01) while holding the insert. If you tighten the screws too much, the soft tip of the screw will be damaged.





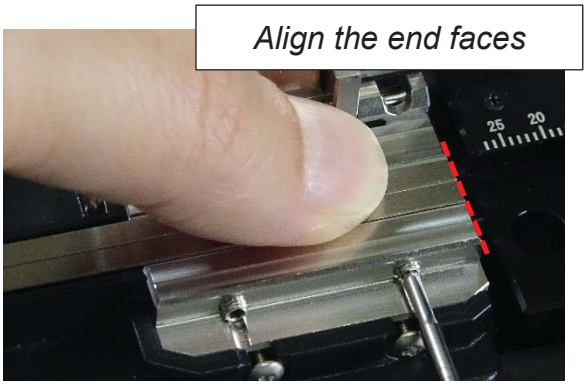
Installing the Lower Inserts

There are two kinds of lower insert: one is with the V-shaped fiber guide, and the other is flat, with no fiber guide. Secure the insert by tightening the screws(SCREW-CT-01) with the hex wrench (HEX-01)

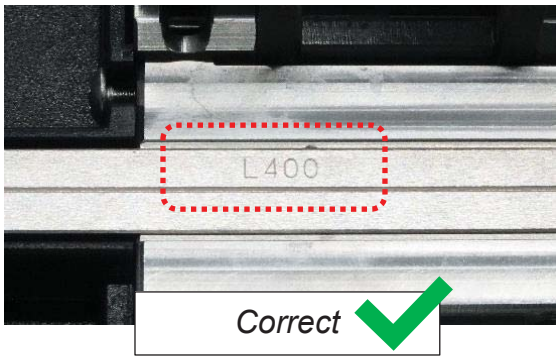


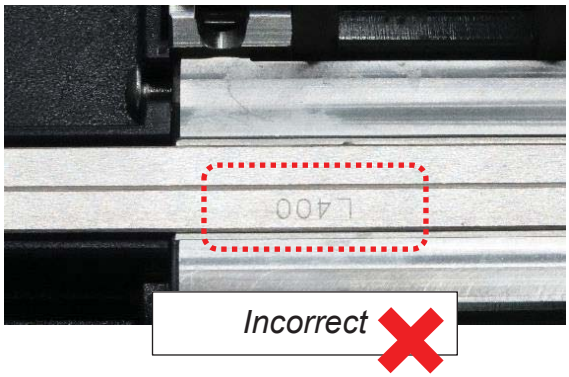
Installing the lower insert with no fiber guide

Confirm that the end of the insert aligns with the edge of the clamp. Install the same type of inserts on both the left and right side.



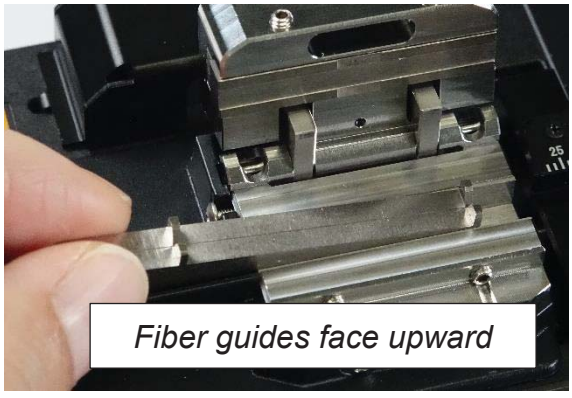
When installing the lower insert with no fiber guide, it must be oriented so that the identification engraving can be read. (see below)

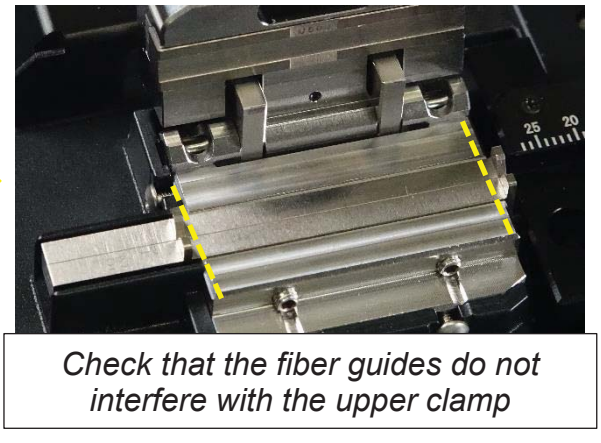




Installing the Insert with fiber guide

Confirm that the clamp can close without hitting the fiber guides before tightening the set screws.





Tighten set screws after confirming the lid will close

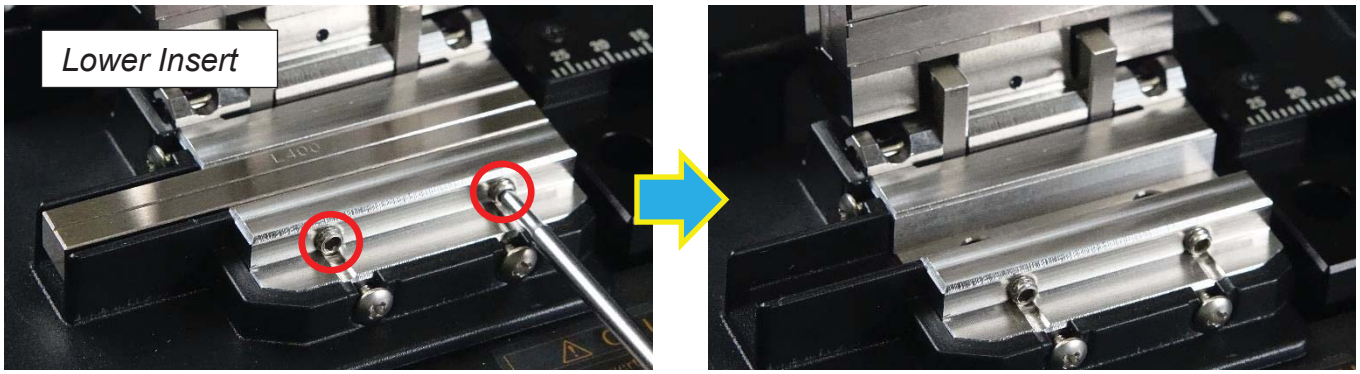
- *Do not overtighten the screws otherwise extreme torque may damage the clamp or the insert*
- *If the tip of the screw is damaged, replace it with a spare screw.*

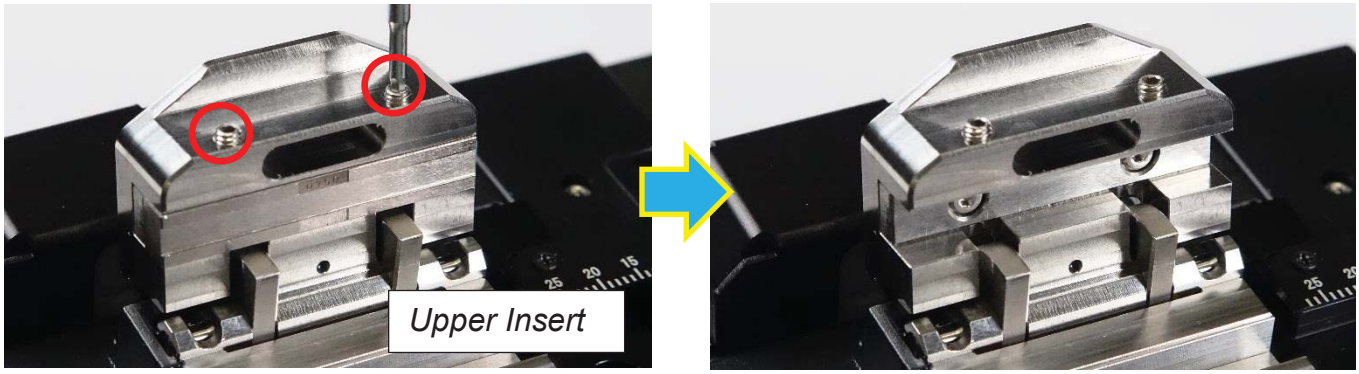
Select the appropriate insert by referring to the Selection Guide.

How to Replace the Inserts

Remove the Inserts

Loosen the screws (circled in red) with a hex wrench(HEX-01) and remove Lower Insert or Upper Insert as shown below.





Replace the insert with the appropriate insert for the cladding diameter or the coating diameter of the optical fiber.
After replacing the inserts, change or edit the cleave mode if necessary.

- *Some inserts have different diameter grooves on both sides.*
  Applicable fiber diameters are different from each other in this case.
  When you replace the insert, confirm that the mark matches the cleaved fiber.

Select the appropriate insert by referring to the Selection Guide.

Selection Guide for Choosing Appropriate Inserts

See the following table to select proper inserts.

- *The numbers in the table refer to applicable fiber diameters in microns (μm) for each combination of upper and lower inserts.*
- *The inserts above 500μm diameter fibers have grooves on both sides. There are markings on either side that shows the fiber diameter of each.*
  In some cases, depending on the coating material, the insert one size smaller than the coating diameter may yield the best performance.

Upper Insert / Lower Insert		INSERT-U-											
		80-400	500-750		1000-1250		1500-1750		2000-2250		2500-3000	
			Mark U500	Mark U750	Mark U1000	Mark U1250	Mark U1500	Mark U1750	Mark U2000	Mark U2250	Mark U2500	Mark U3000
INSERT-L-80		54 to 107										
INSERT-L-125		84 to 167										
INSERT-L-160		107 to 213										
INSERT-L-250		167 to 333										
INSERT-L-400		267 to 533	400 to 533									
INSERT-L-500-750	Mark L500	334 to 667	467 to 667	550 to 667								
	Mark L750		634 to 868	717 to 1000	787 to 1000							
INSERT-L-1000-1250	Mark L1000			884 to 1118	954 to 1188	1037 to 1272						
	Mark L1250				1120 to 1355	1204 to 1438	1287 to 1522					
INSERT-L-1500-1750	Mark L1500					1370 to 1605	1454 to 1688	1537 to 1772				
	Mark L1750						1620 to 1855	1704 to 1938	1780 to 2015			
INSERT-L-2000-2250	Mark L2000							1870 to 2105	1947 to 2288	2030 to 2065		
	Mark L2250								2114 to 2348	2197 to 2432	2280 to 2515	
INSERT-L-2500-3000	Mark L2500									2364 to 2598	2447 to 2682	2614 to 2848
	Mark L3000										2780 to 3015	2947 to 3182

Select the inserts according to the cladding diameter and the jacket diameter of the optical fiber to cleave. basically, the jacket side of the optical fiber comes to the left clamp unit, the cladding side of the optical fiber comes to the right clamp unit.

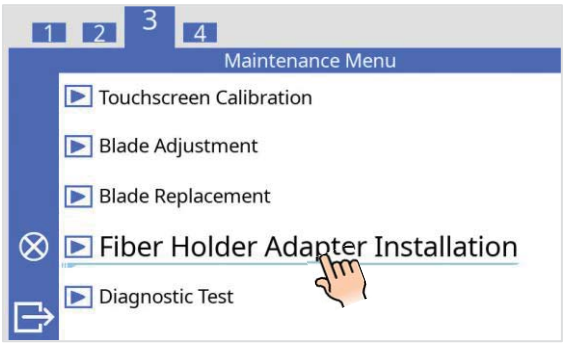
Fiber Holder Adapter Installation

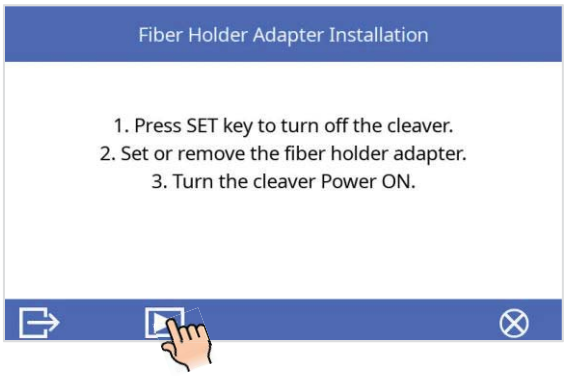
The Fiber Holder series FH-100 and FH110 can be used with the Fiber Holder Adapter (FHA-CT115).

When attaching the Fiber Holder Adapter, select the [Fiber Holder Adapter Installation] option in the [Maintenance Menu], then use the included hex wrench (HEX-01) and follow the machine's prompts to install the Fiber Holder Adapter.

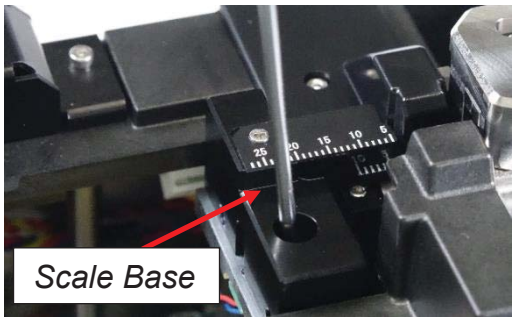
Procedure:

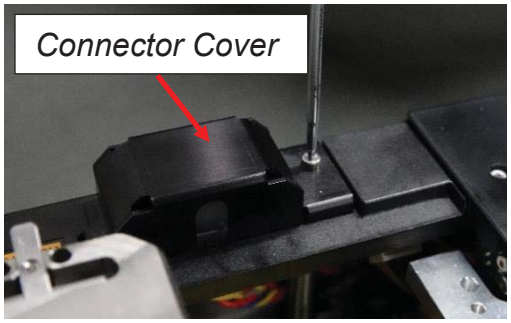
1. *Press the DOWN key to go to the [Cleave Menu].*
2. *Select the [Fiber Holder Adapter Installation] function in the [Maintenance Menu], then Press the SET key.*





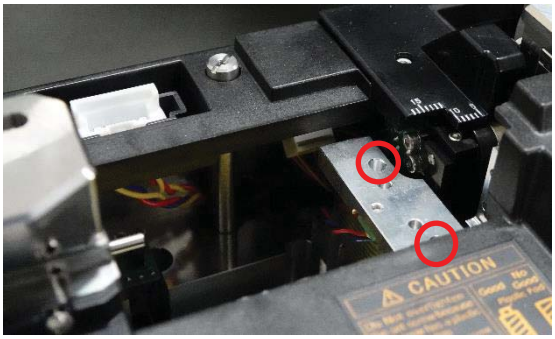
3. *After the machine resets, the left clamp will automatically retract and the machine will power off.*
4. *Remove the scale base and the connector cover.*

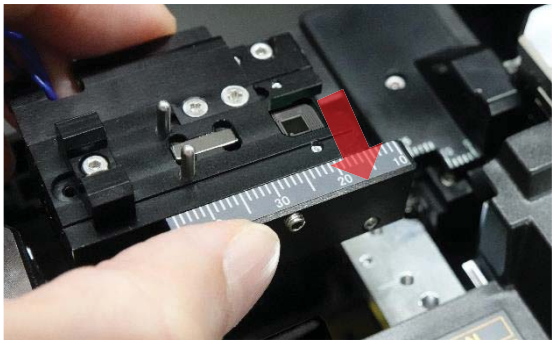




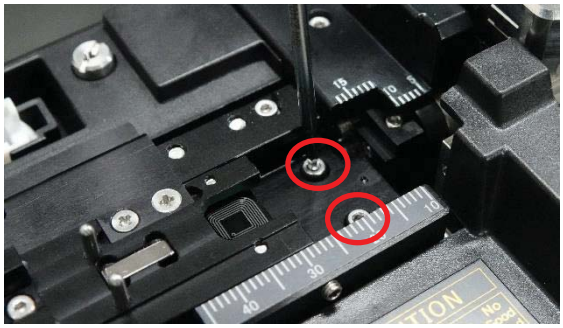
➢ *Be careful not to drop the screws or Fiber Holder Adapter inside the device.*

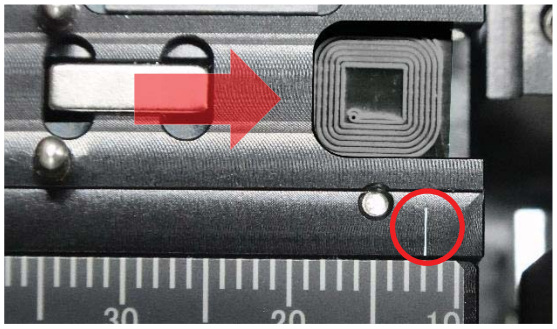
5. *Align the two large pins in the underside of the Fiber Holder Adapter to the holes shown below, circled in red.*



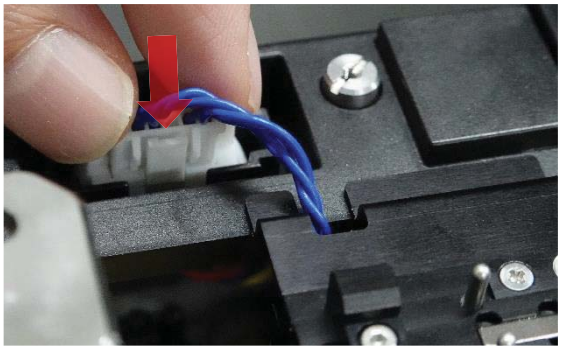


6. *Once set in place, tighten the two hex screws to secure the Fiber Holder Adapter. Slide the Fiber Holder Adapter platform so that the mark is aligned to the 12mm position.This is the standard fiber length used in the FSM-100M/P.*





7. *Tighten the two screws with red the arrows as below, and then insert the connector into the plug.* <u>*Do not overtighten.*</u>



8. *Turn the cleaver ON. The left clamp will move forward and stop at the back of the Fiber Holder Adapter.*

When removing the Fiber Holder Adapter, follow the same process as above.

Using the Fiber Holder Adapter

The fiber holder functions become available when the Fiber Holder Adapter is attached to the device.

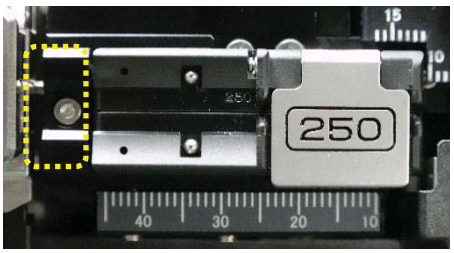
Even with a fiber holder in place, the cleaver uses only the left and right clamps to apply tension. This means the fiber holder must remain open until the cleave is finished

Options when using the Fiber Holder Adapter

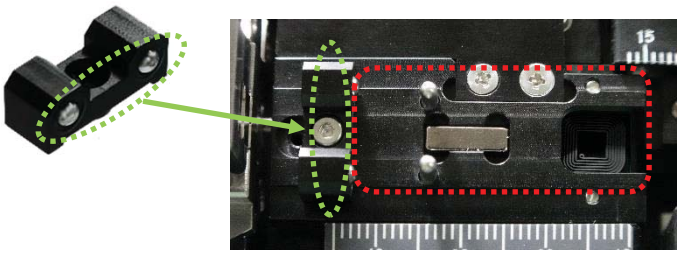
- *Adjust the position of the positioning block depending on the fiber holder being used.*
- *Fiber Holder Management is only available when using FH110 series fiber holders.*

Set the location of the positioning block

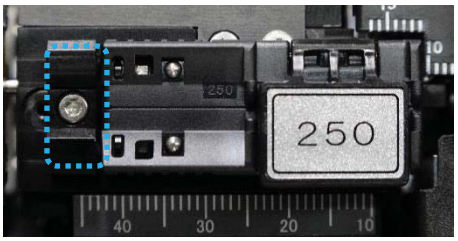
The location of the positioning block is different depending on the the fiber holder being used. For FH-100 fiber holders, it should be adjusted to the back of the adjustment slot, and for FH110 fiber holders, it should be placed at the front of the slot.



Mounted on rear side with FH-100



Set the plunger side toward the fiber holder

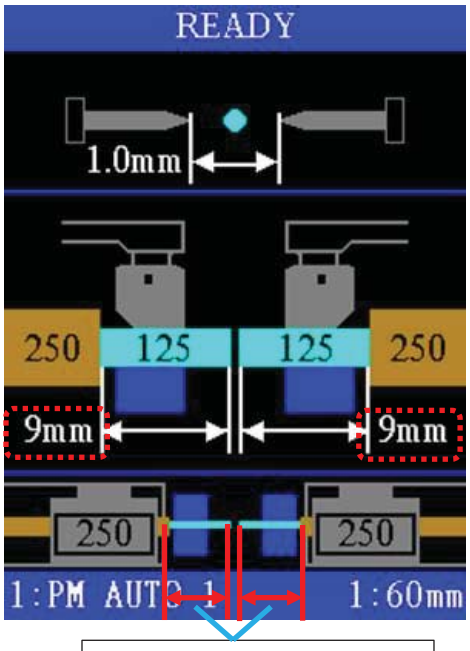


Mounted on front side with FH110

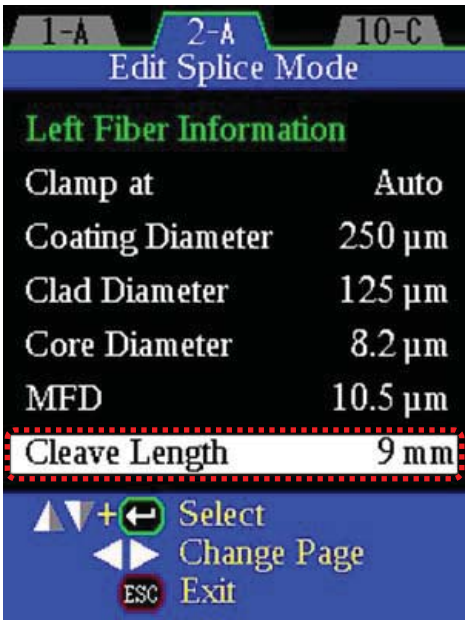
Fiber Holder Adapter Position Adjustment

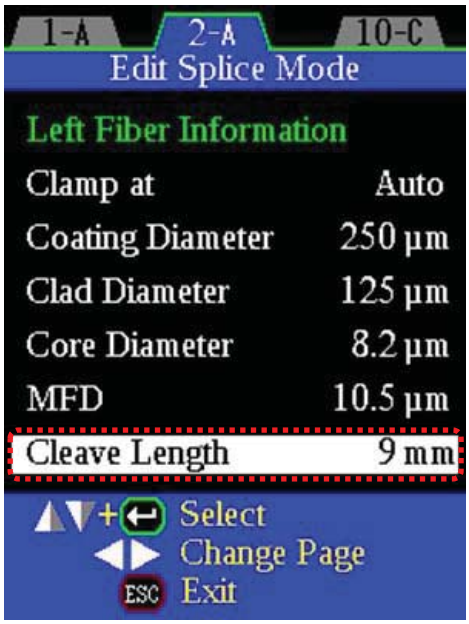
Align the Fiber Holder Adapter position according to the splicer settings.

Example: Using an FSM-100 series splicer, the total fiber length from the fiber holder is 12mm by default, so the cleave length is set to 9mm.

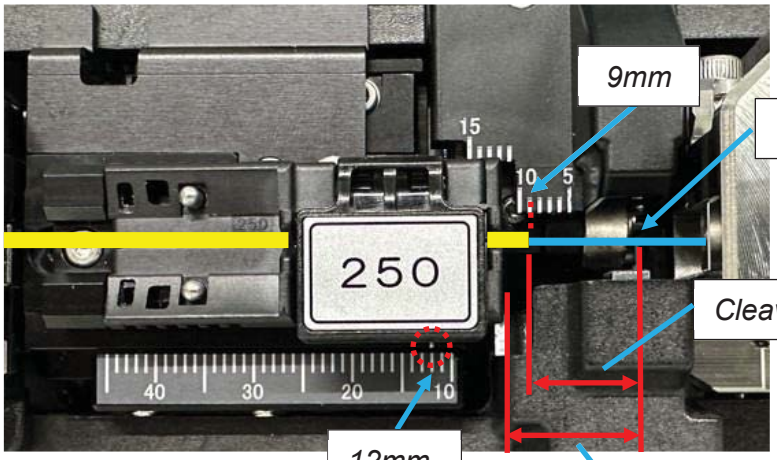


Total Fiber length from the fiber holder : 12mm





When an FSM-100 series splicer is used in the standard position, set the Fiber Holder Adapter position to 12mm as shown below. The scale on the Fiber Holder Adapter reflects the total fiber length from the fiber holder.



9mm

Cleave location

*Cleave Length : 9mm**

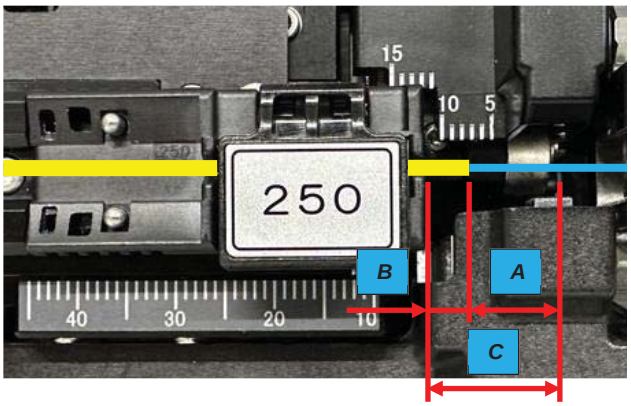
12mm

*Total Fiber Length from Fiber Holder: 12mm***

** "Cleave Length" refers to the distance between the cleave location and the coating edge.*

*** "Total Fiber Length from Fiber Holder" refers to the distance between the cleave point and the fiber holder edge.*

Refer to the following table for the anther cleave length options.

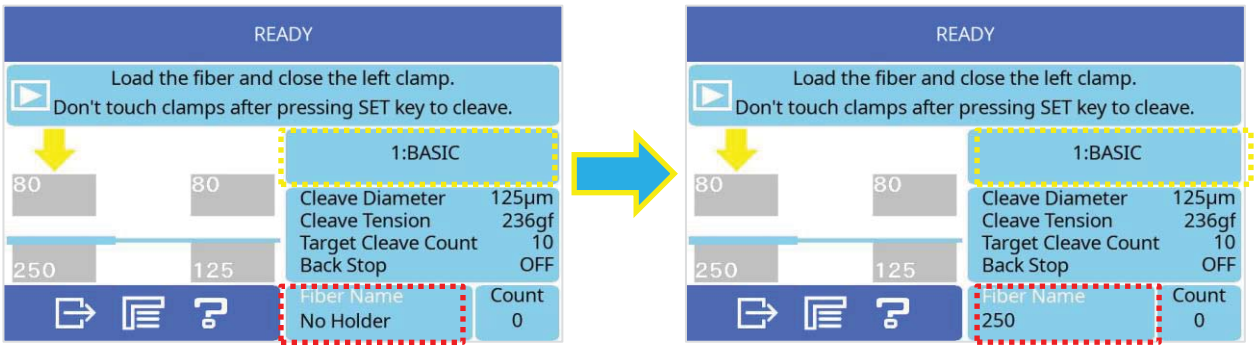


		A	B	C
		Cleave length	Coating length	Total fiber length
Standard	Glass clamp splicing	9mm	3mm	12mm
	Coating clamp splicing	4mm	8mm	
Optional	Glass clamp splicing	8mm	3mm	11mm
	Coating clamp splicing	3mm	8mm	
	Glass clamp splicing	10mm	3mm	13mm
	Coating clamp splicing	5mm	8mm	

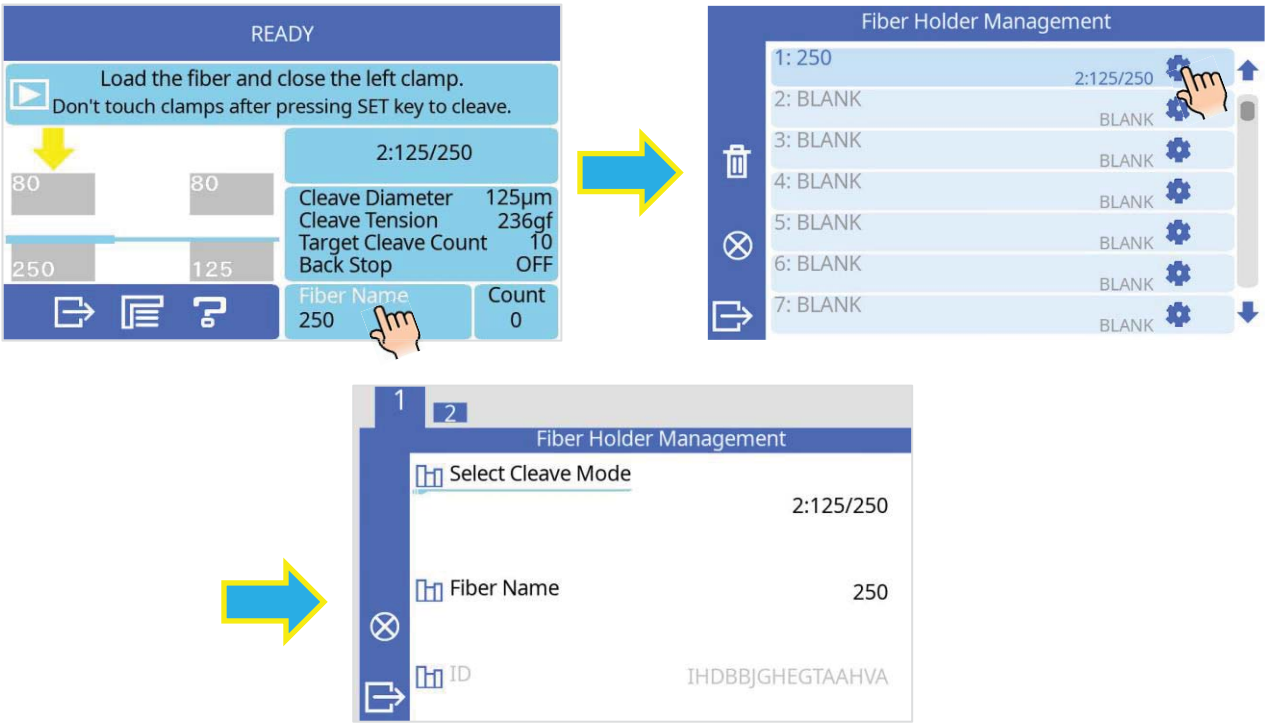
Fiber Holder Management with FH110 fiber holders.

When a FH110 fiber holder is placed onto the Fiber Holder Adapter, the cleaver will automatically select the cleave mode that is registered to the fiber holder.

1. *When loading the FH110 on the Fiber Holder Adapter, the fiber holder name appears in the "Fiber Name" window on the [READY] screen.*

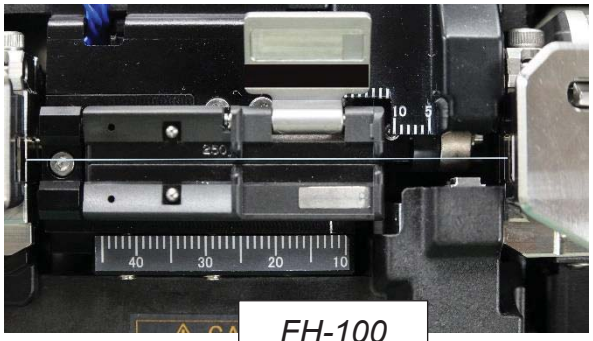


2. *Touch the [Fiber Name] icon to go to the [Fiber Holder Management] menu. Press and hold the icon to enter the [Fiber Holder Management] screen for the selected fiber holder. The operator can configure fiber holder settings here.*

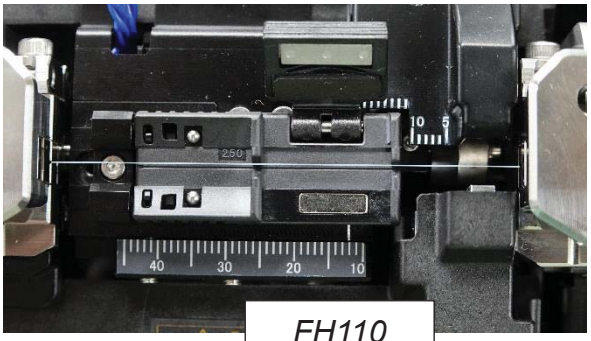


Using a fiber holder with the Fiber Holder Adapter

Open the lid of the fiber holder before cleaving the fiber as shown below.



FH-100



FH110

- *Always leave the fiber holder lid open when cleaving with the Fiber Holder Adapter.*

Storing the cleaver

When the Fiber Holder Adapter is installed, the left clamp cannot fully return to its home position and is not able to sit in the shipping box. Remove the Fiber Holder Adapter for storage or shipping.

Power Supply

1. *Only use a genuine Fujikura AC adapter and AC power cord.*

AC Adapter [ADC-21]

*AC power cord [ACC-**]*

2. *Plug in the AC cord and insert the AC cord into the AC inlet of the ACC-**.*

ADC-21

3. *Plug the AC adapter cord into the power port of the cleaver.*

Disconnect the AC power cord from the AC adapter or from the wall outlet immediately when mechanical or electrical problems occur with the cleaver or AC adapter. Use the cleaver in a place where you can quickly access to disconnect the power cord.

Turning Power ON/OFF

Turning the cleaver ON

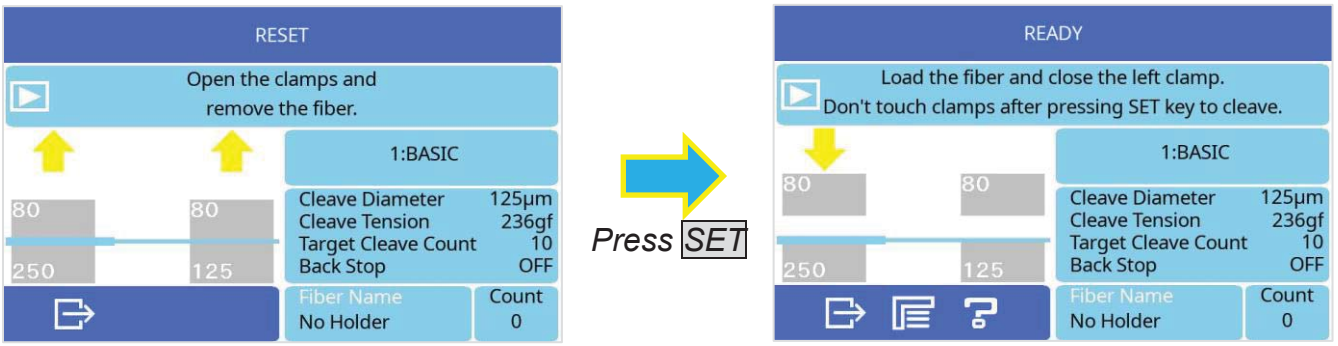
1. *Remove any fiber before powering on the cleaver.*

> ➢ *It is possible that the left clamp may impact and break fibers since the left clamp stage moves forward to "Reset" when the power is turned on.*

2. *Press the ON/OFF key and hold until the green LED turns on.*

3. *Press the SET key to set the cleaver to its "Ready" state.*

The left clamp stage will Reset, and the cleaver will be ready to use.



Power ON

Ready to cleave

Turning the cleaver OFF

1. *Remove any fiber before powering off the cleaver.*
2. *Press the ON/OFF key and hold until the red LED turns on.*

➢ *It is possible that the left clamp may impact and break fibers, since the left clamp stage moves forward when the power is turned off.*

3. *Confirm that all motors are stopped and the red LED has turned off. Unplug the power cord from the cleaver.*

Forced Shutdown

The cleaver can be shut down in emergency, without movement of motors if the ON/OFF key is held for a certain time after the red LED lights up. In the event of some malfunction, shut the cleaver down immediately using this process and unplug the AC cord. Do not use this immediate shutdown function before you move or ship the cleaver. Vibration or shock during transportation may damage the clamp stage when the left clamp is not in the home position.

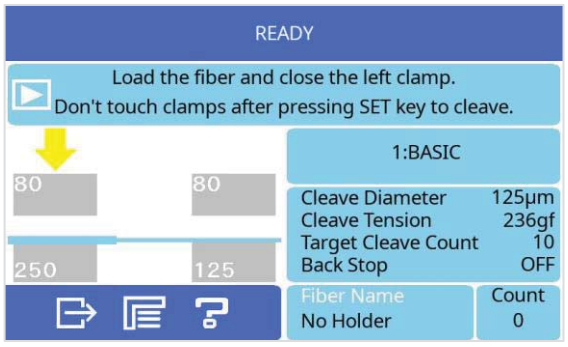
Disconnect the AC power cord from the AC adapter or from the wall outlet immediately when mechanical or electrical problems occur with the cleaver or AC adapter. Use the cleaver in a place where you can quickly access to disconnect the power cord.

Sheet Key Operations on the [READY] Screen

Use the sheet keys for the following operations on the [READY] screen.

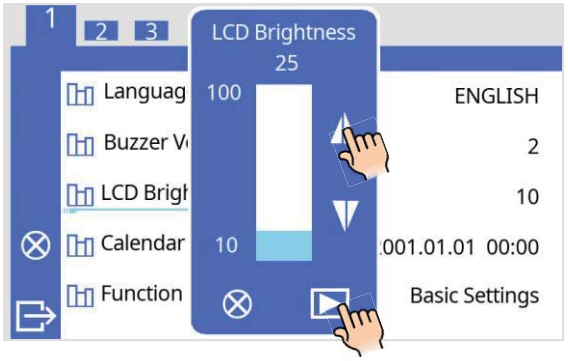
Screen Brightness

The monitor may appear different depending on the working environment, press the UP *key to go to the* [LCD Brightness] menu, *and touch the* UP/DOWN *icons to adjust the screen brightness. Press the* SET *key or the*  *icon to confirm your setting.*



[READY] screen

UP *key*

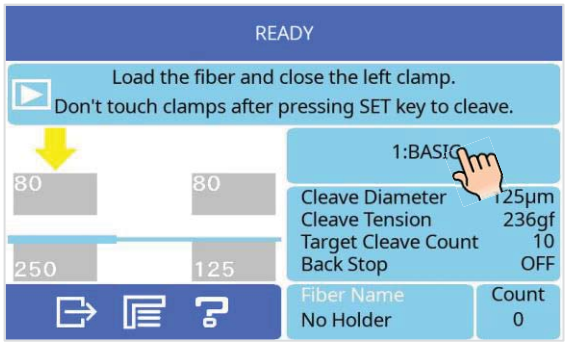


[LCD brightness] screen

SET *key or*  *to confirm*

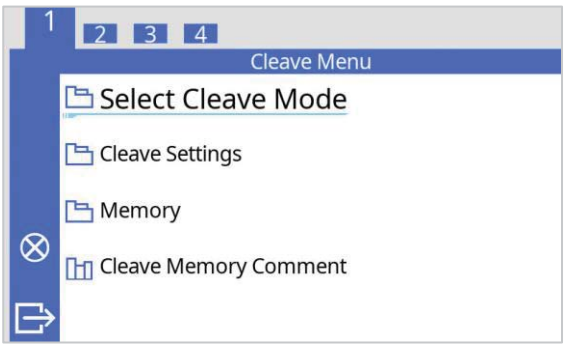
Cleave Menu

Press the DOWN *key to go to the [Cleave Menu].*



[READY] screen

DOWN *key*

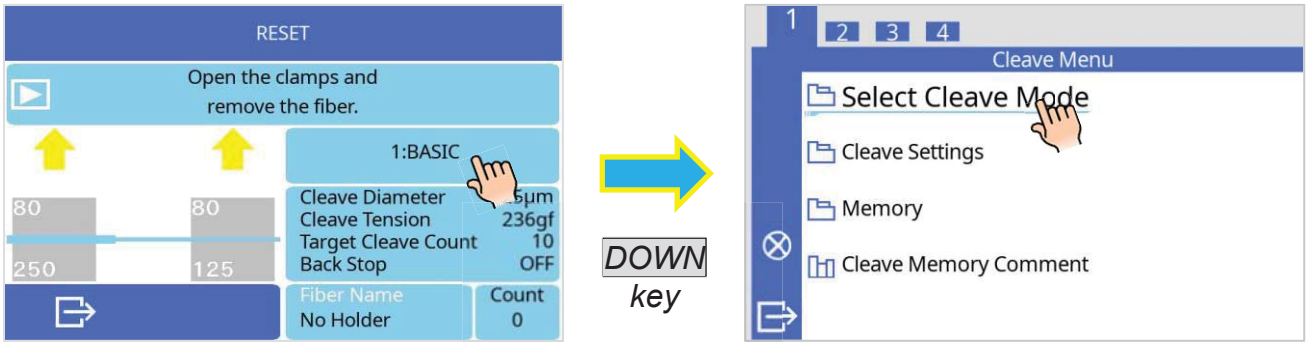


[Cleave Menu] screen

Selecting a Cleave Mode

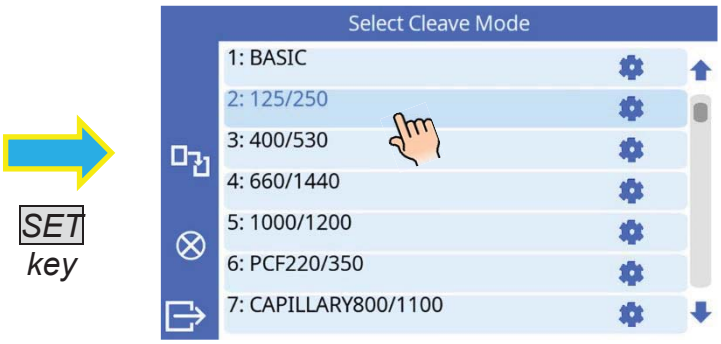
Select the insert according to the cladding diameter and the coating diameter of the optical fiber being cleaved. When the insert is changed, select an appropriate cleave mode, or edit the cleave mode to reflect the appropriate clamp diameter.

1. *Press the DOWN key on the [READY] screen to enter the [Cleave Menu].*



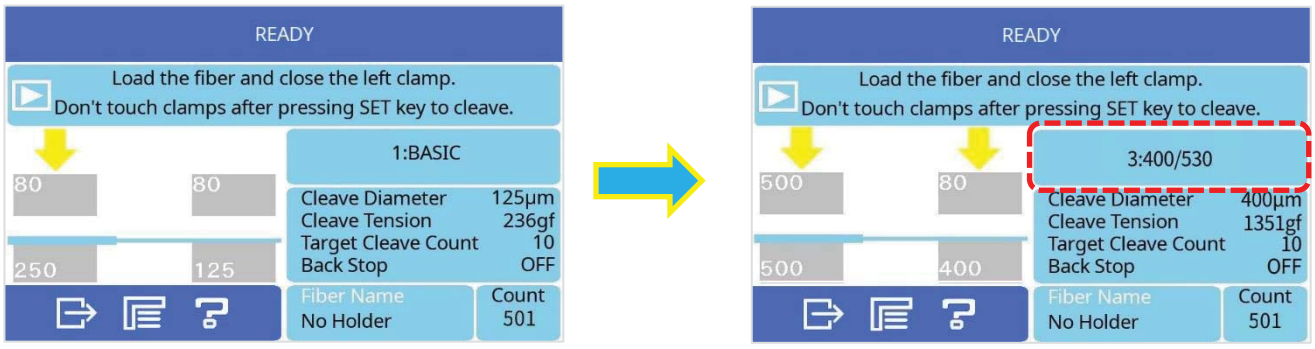
[READY] screen *[Cleave Menu] screen*

2. *Select [Select Cleave Mode] and press the SET key.*
3. *Touch to select a cleave mode, or use the UP/DOWN keys and press SET.*



[Cleave Menu] screen

4. *The newly selected cleave mode can be verified on the [READY] screen.*



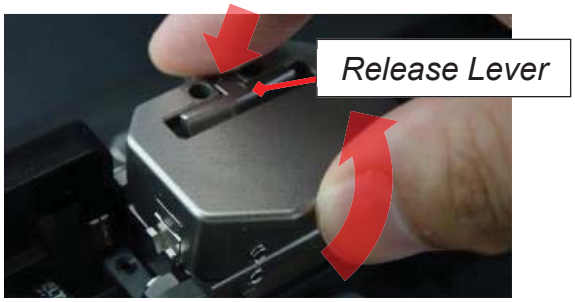
> ➢ *In some cases the cleaver moves the left clamp after cleave mode is changed. Remove the fiber from the cleaver if the cleaver warns that fiber should be removed.*

Loading Fiber into the Cleaver

1. *When the screen shows "[READY]," confirm that no fiber is loaded in the cleaver, then press the SET key. The left clamp will move to the position determined by the [Left Clamp Position] setting in the cleave parameters.*

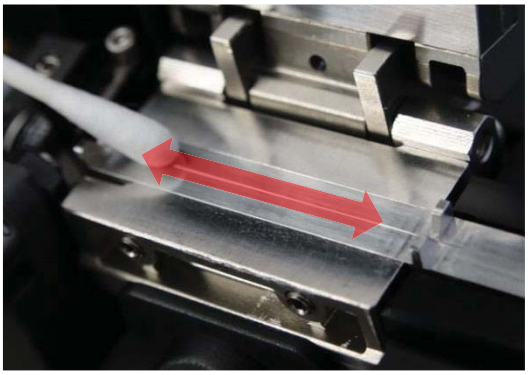
   Skip this step if the monitor shows [FIBER SET OPERATION].

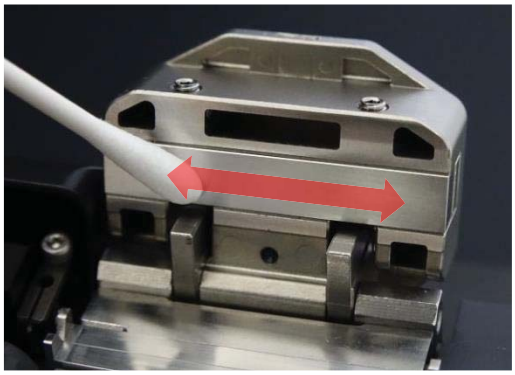
2. *Open both the left and right clamps. To open the clamps, push and hold the release lever and lift the lid of the clamp.*



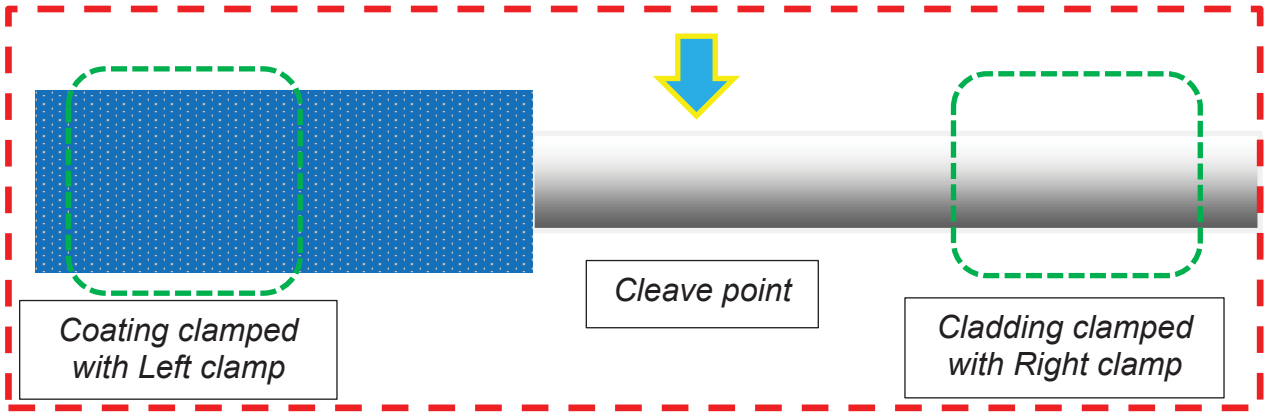
➢ *Confirm there is no dust or dirt on the clamp or insert. Refer to "Pre-Operation Cleaning and Checking" for instructions on cleaning the clamp and insert.*

3. *Clean the insert with an alcohol-impregnated cotton swab. If the inserts are not clean enough, the fiber may slip during cleaving. Always inspect the insert before cleaving. If the insert is dirty, clean with alcohol.*



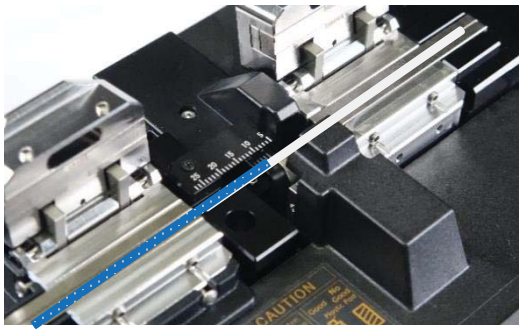


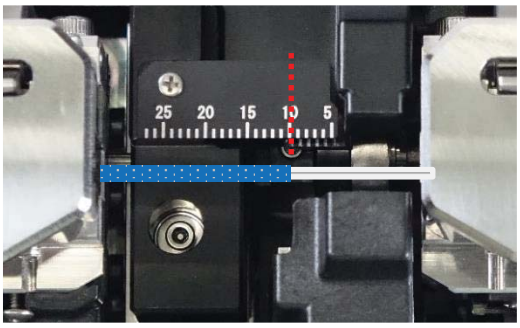
4. *Remove the coating from the fiber and clean the cladding and the coating surface to be clamped with an alcohol-moistened wipe. (Areas shown below)*



➢ *If you use alcohol to clean the fiber, use an alcohol having 99% or greater purity.*

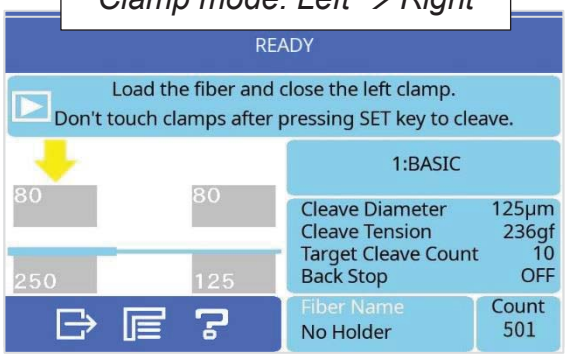
5. *Place the fiber on the groove of the lower insert. Adjust the end of the coating to the scale mark according to the desired cleave length setting.*
Make sure the loaded fiber spans the entire length of both upper clamps.



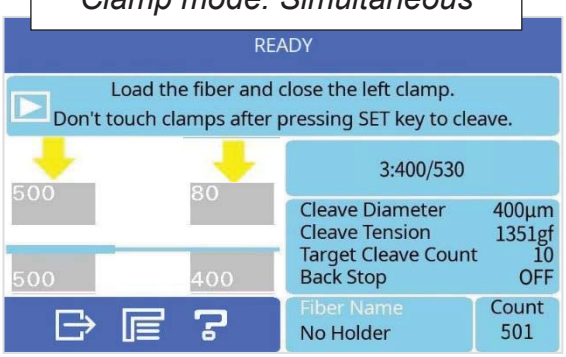


6. *Close the clamp(s) as directed by the yellow arrows on the cleaver's screen.*

Clamp mode: Left → Right



Clamp mode: Simultaneous



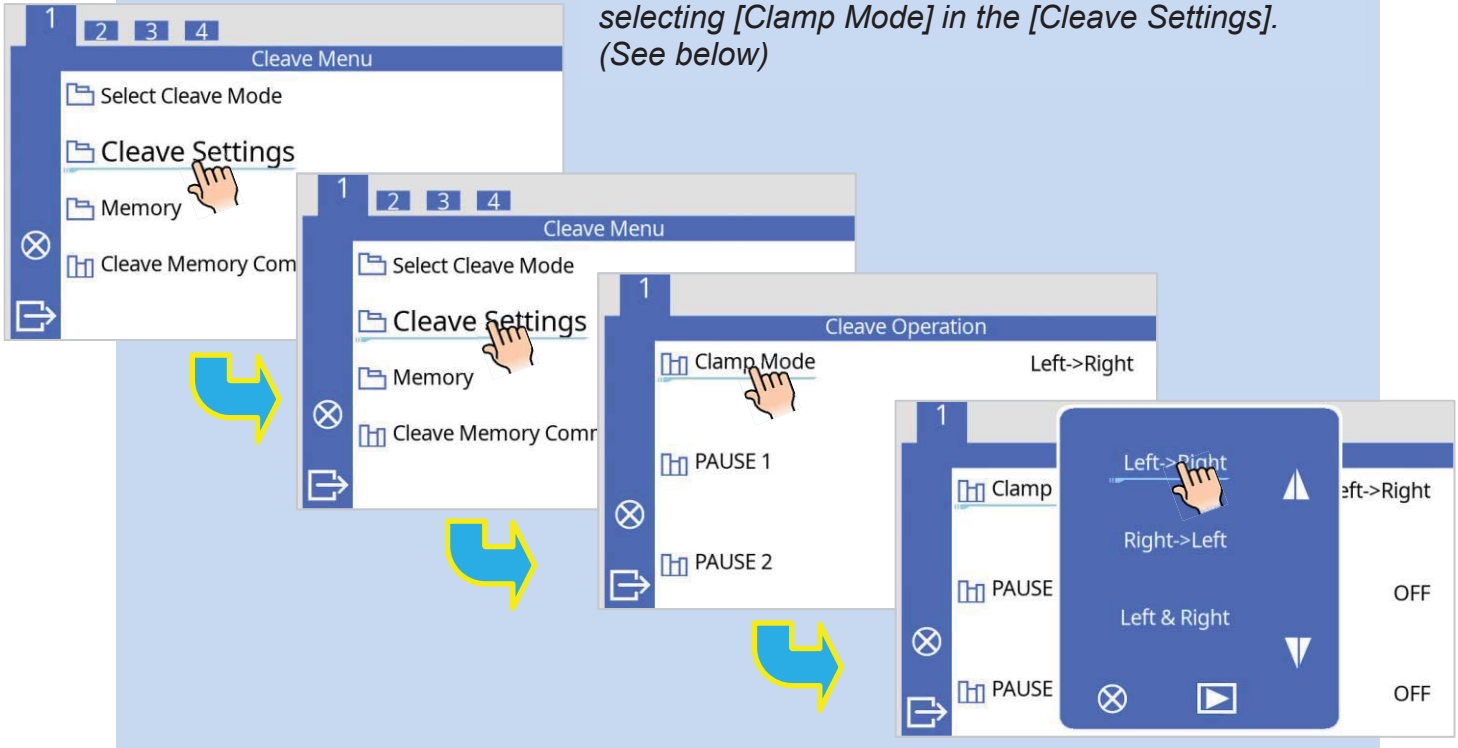
7. *Confirm the release lever latches when the clamps are closed.*

Release lever latched

Release lever not latched

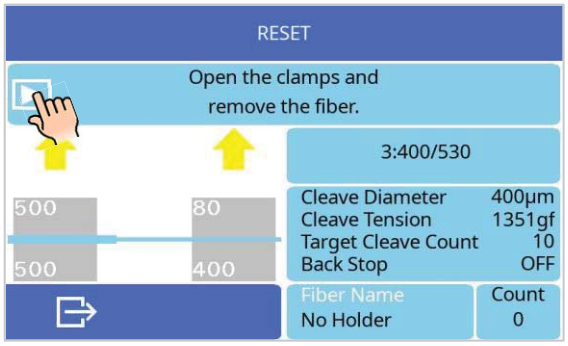
- *If the lever doesn't latch, check if dust or debris is in the clamp.*
- *Take care to always gently open and close the clamp lid. Otherwise, it is possible to cause misalignment of the fiber or the insert.*

The closing order of the clamps can be set by selecting [Clamp Mode] in the [Cleave Settings]. (See below)



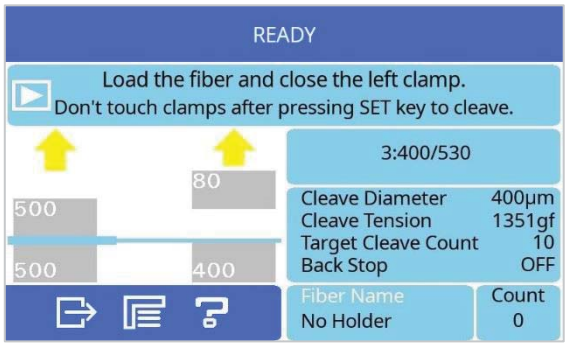
If the "Left & Right" option is selected, it is possible that the fiber may twist during clamping, causing a bad cleave. If this happens, select "Left -> Right" or "Right -> Left" as the clamping option.

8. *Press the SET key to begin clamping the fiber. The clamps will apply the calibrated clamping force automatically, based on the [Left/Right Clamp Force] parameter in the cleave mode.*

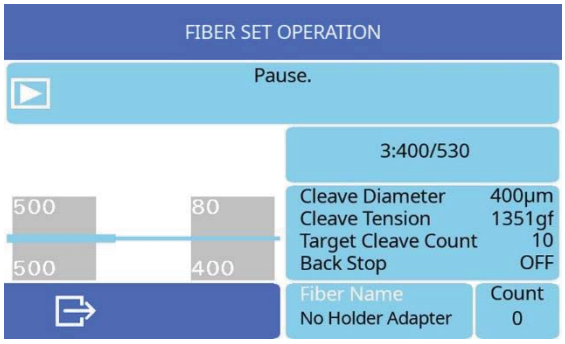


Clamp

9. *If the [Clamp Mode] is set to "Left -> Right" or "Right -> Left",close the other clamp lid. If [Pause 1] is set to "ON", press the SET key after closing the other clamp lid. If [Pause 2] is set to "ON", after the clamp lid is closed and clamping force is applied, the cleaver will stop before applying tension to the fiber. Press SET to proceed.*



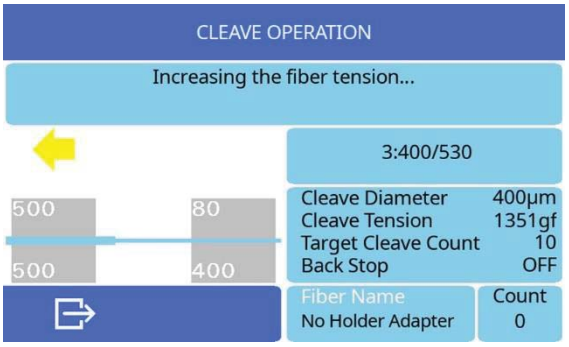
[Pause 1] screen



[Pause 2] screen

10. *After both clamps are closed, the cleaver will start applying tension to the fiber according to the [Cleave Tension] parameter in the cleave mode.*

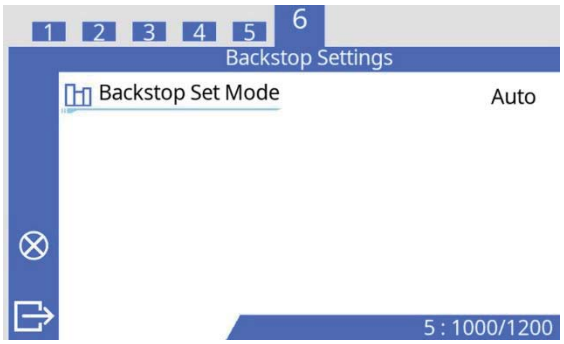
**The CT116 applies tension automatically after rotating the optical fiber according to the [Rotation Angle] parameter in the cleave mode.*

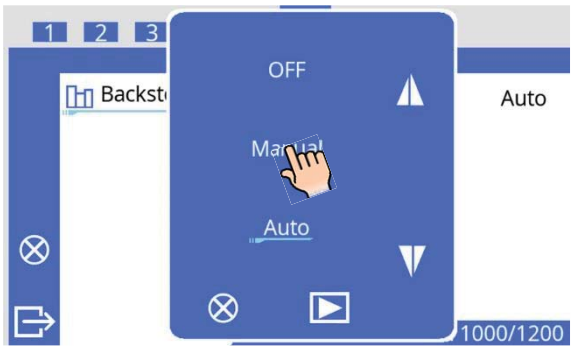


➢ *Do not touch the clamps or the fiber while tension is applied.*

11. *If "[Pause For Backstop Set]" is set to "Auto," the backstop will automatically advance to detect the fiber's position and will stop after tension is applied.*

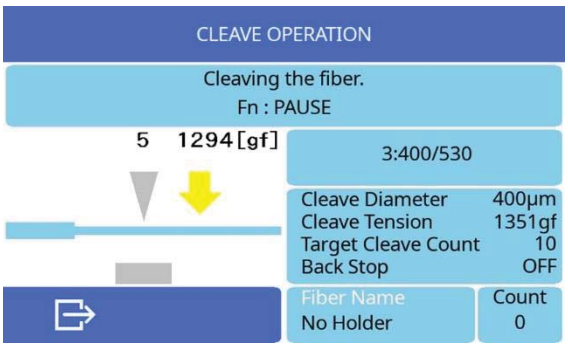
    If "[Pause For Backstop Set]" is set to "Manual," use a magnifying glass or microscope to adjust the backstop so that the backstop end-face just barely touches the fiber.





➢ *The backstop is already set to be used in cleave modes for the fibers listed below;*
- *Cladding is 800µm or greater.*
- *PM fiber*
- *PCF*
- *Capillary*

12. *Press the SET key to start cleaving the fiber.*



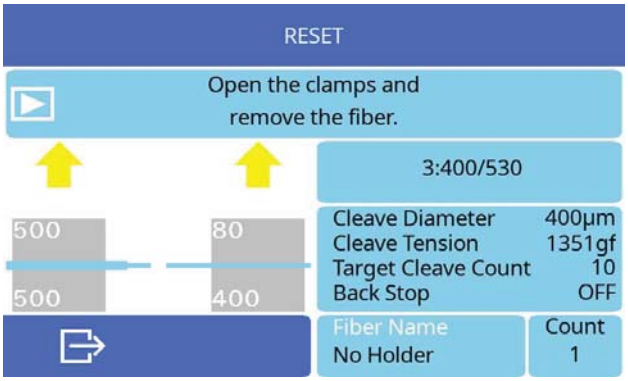
Cleaving…

➢ *Do not allow hands or fingers near the blade; it may cause serious injury.*

Removing the Fiber

1. *After cleaving, the left clamp will move backward and then pause when the Fiber Holder Adapter is not installed.*

   When the Fiber Holder Adapter is installed, the left clamp does not move after cleaving.



Pause (cleaving finished)

2. *Open the clamps and unload the fiber after the cleaver releases the clamp force.*

   If the Fiber Holder Adapter is being used, close the fiber holder clamp lid, release the left clamp, and remove the fiber holder with the cleaved fiber in it.

- *Remove the fiber carefully so that the end-face does not contact anything.*
- *Keep your hands and fingers away from moving parts to avoid injury.*

Storing Cleave Results

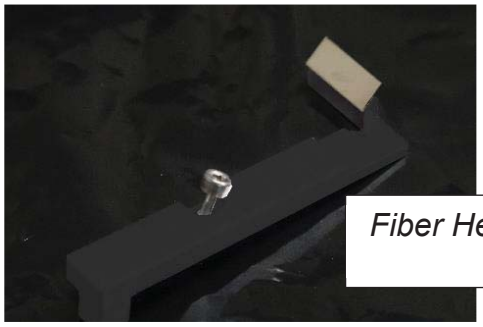
Cleave results can be stored in the cleaver's internal memory.
When a cleave is finished, the results are automatically stored in memory.

Refer to "Memory of Cleave Result" in the "Cleave Menu" section for details.

- *After 10,000th result is stored, the 10,001st cleave result will be written over the 1st result. The old set of 10,000 memories will be overwritten and deleted.*

Fiber Position Confirmation

When the cleave angle and shape are unstable, there is possibly a height misalignment between the left and right clamps. In this case, use the Fiber Height Checking Mirror (CM-CT115) to find the height difference between the left and right sides.



Fiber Height Checking Mirror (CM-CT115)

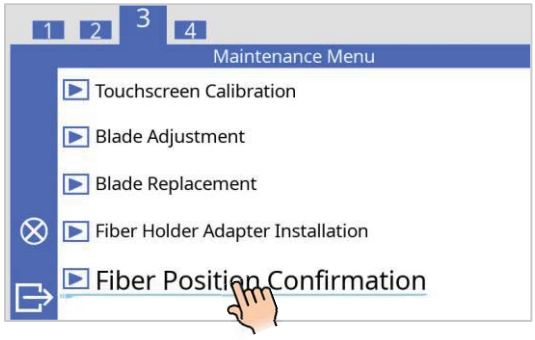
Normally, there is not much difference between the cleaving diameter and coating, but any special coating diameter or special cleaving diameter could cause a misalignment between the left and right sides.

To inspect the fiber position:

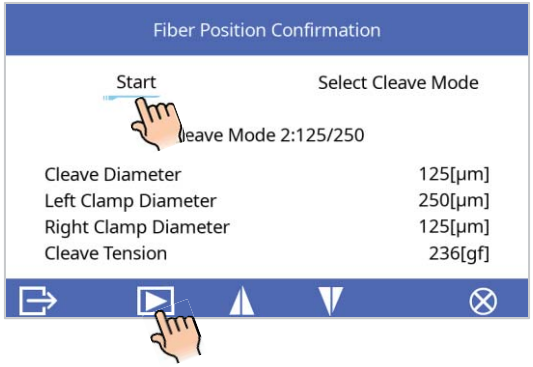
1. *Remove the scale base from the body.*

Remove Scale Base

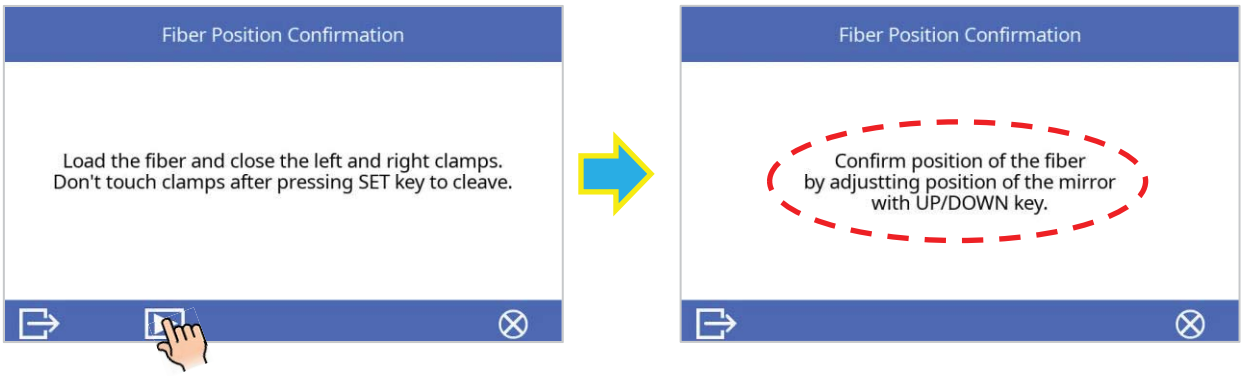
2. *Select [Fiber Position Confirmation] in the [Maintenance Menu].*



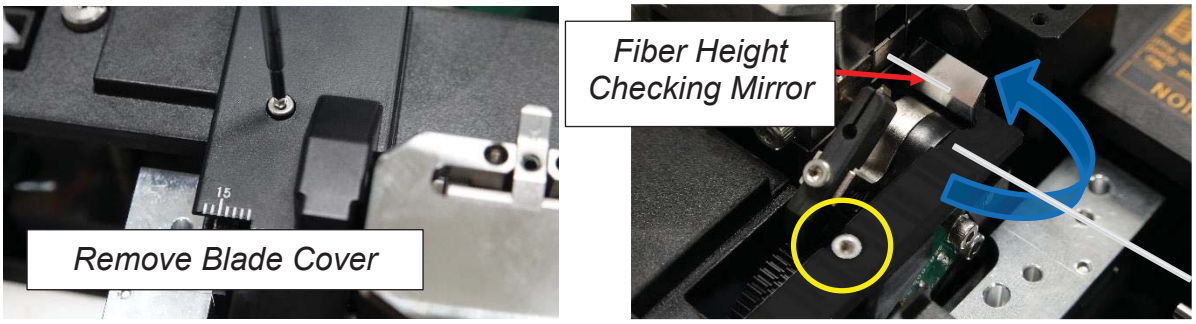
3. *Select the cleave mode and press "Start" and press*  *icon to start.*



4. *Follow the on-screen instructions. A cleaving operation will start after a fiber is loaded. After cleaving, the screen will show the message circled below.*

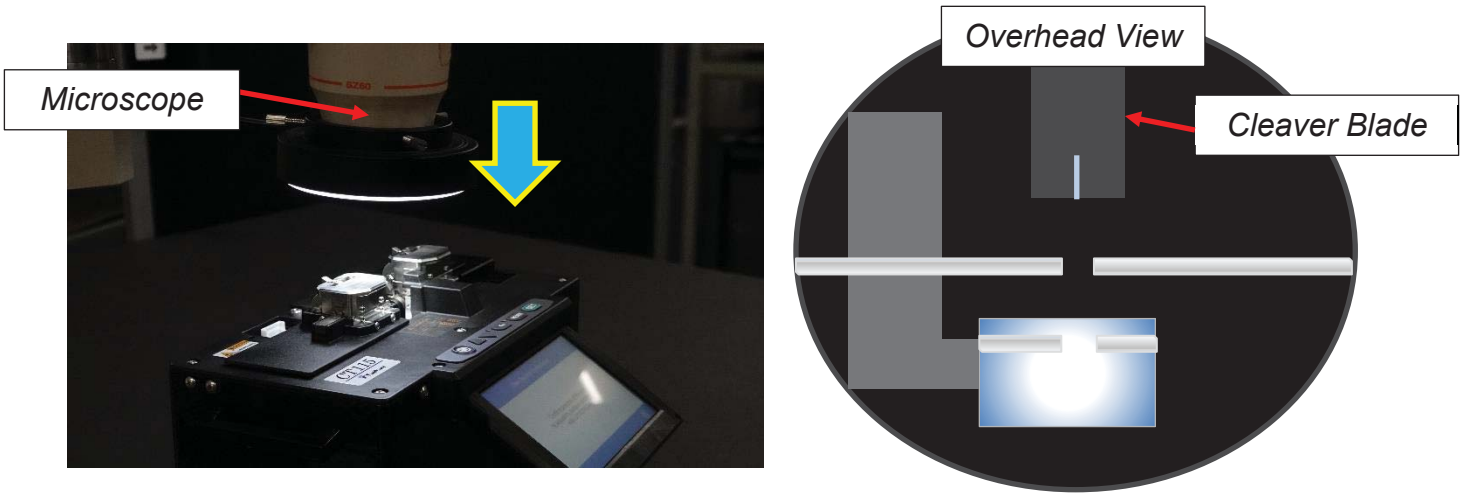


5. *Remove the blade cover, then attach the Fiber Height Checking Mirror in its place.*



The mirror of the Fiber Height Checking Mirror should pass under the fiber, and be secured with the screw circled in yellow above.

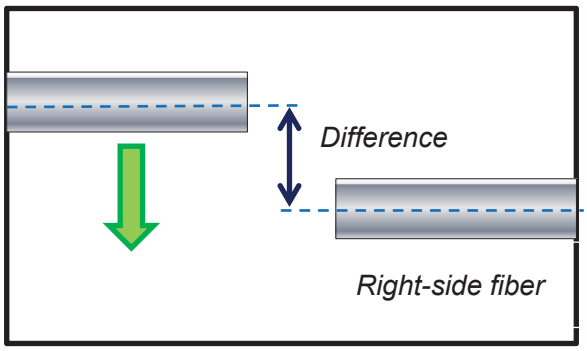
6. *Position a microscope directly above the cleaver to use the Fiber Height Checking Mirror for inspection.*



- *Set the microscope directly above the mirror.*
- *Use a magnifier with at least 10x magnification if you don't have a microscope.*

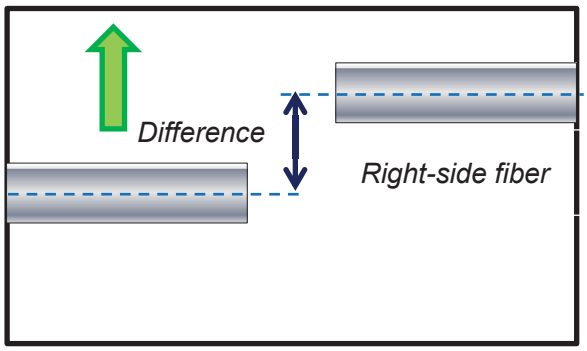
7. *Inspect the fiber with a microscope. Inspect the difference between the centers of each fiber.*

Reflected fibers on the mirror



Increase the thickness of the shim.
The left fiber position is low.

Reflected fibers on the mirror



Decrease the thickness of the shim.
The left fiber position is high.

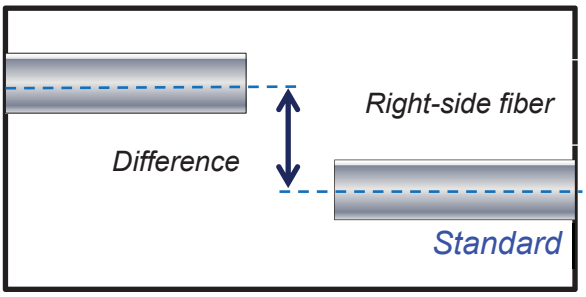
Guidelines for fiber height adjustment

*Height is adjusted using shims underneath the left insert base.

- *Difference within 100µm……No adjustment needed*
- *Difference 110µm～200µm……...Increse or decrease the thickness of the shim on the left clamp to adjust*
- *Difference 210µm or more……Use a different size of insert.*

8. *Observe the fiber from directly above with a microscope.*
Check the difference between the centers of each side of the cleaved fiber.

Cleaved fiber as seen by the mirror:



Guideline for lateral adjustment

- *Difference within 200µm……..No adjustment needed*
- *Difference 210µm or more……..Improper clamp position. May cause poor cleaving*

Check for misalignment between the left and right clamps

➢ *The actual image of the cleaved fibers shows misalignment between the left and right fibers. If there is the difference of 200µm or more, there is a possibility of malfunction of the cleaver. Please contact a service center.*

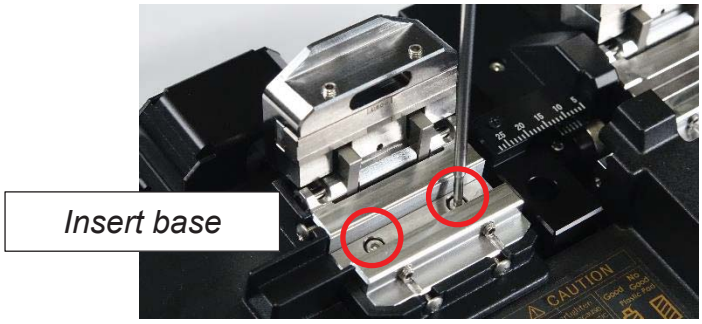
How to Replace the Shims

The height difference between the left and right side is adjusted by changing the thickness of the shim under the insert base of the left clamp. If cleaving results are not stable or the height difference between the left and right fibers after cleaving is large, change the thickness of the shims to adjust the fiber height.

- *The 200µm-thick shim is installed under the left clamp from the factory. The 30µm, 50µm, and 100µm shims are enclosed as standard accessory items.*

Follow the procedures below to replace the shims:

1. *Remove the insert from the left clamp.*
2. *Remove the screws from the insert base. (circled in red below)*



- *Be careful not to drop the screw into the inside of the cleaver.*

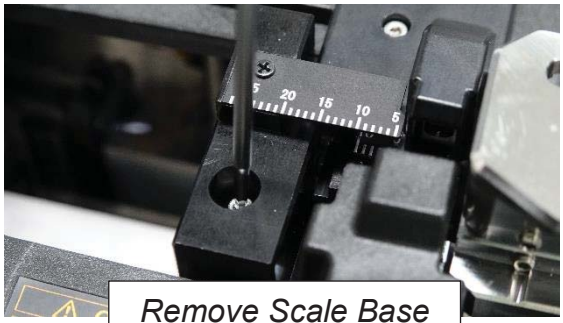
3. *Remove the insert base and install a shim with the appropriate thickness.*

- *Ensure that there is no curve on the shim.*
- *Confirm that there is no dust or dirt on the shim.*

4. *Re-install the insert base and tighten the screws.*

Daily Maintenance

Clean the blade and backstop before cleaving operation to prevent poor cleave results.

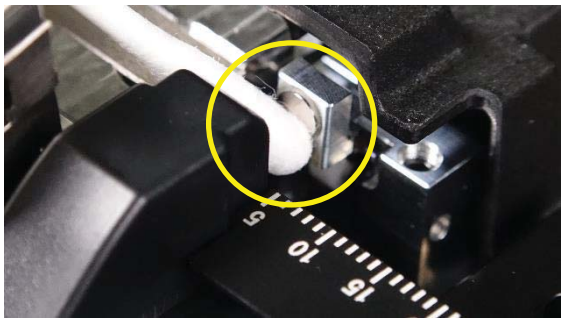


Remove Scale Base

Remove Blade Cover

Cleaning the Backstop

Gently *wipe the backstop sensor with a cotton swab dipped in alcohol.*



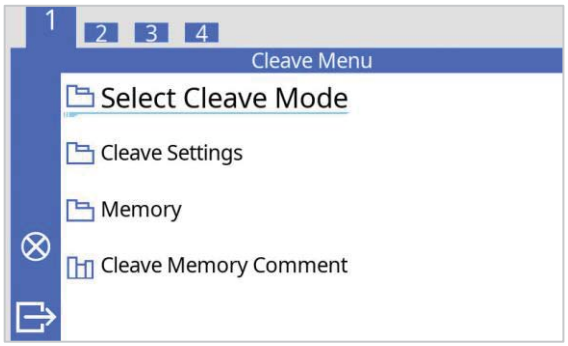
Cleaning the Cleaver Blade

Lightly *wipe the side of the cleaver blade with a cotton swab dipped in alcohol. Be careful to avoid getting cut by the cleaver blade.*

Re-attach the blade cover and the scale base.

Composition of Cleave Menu

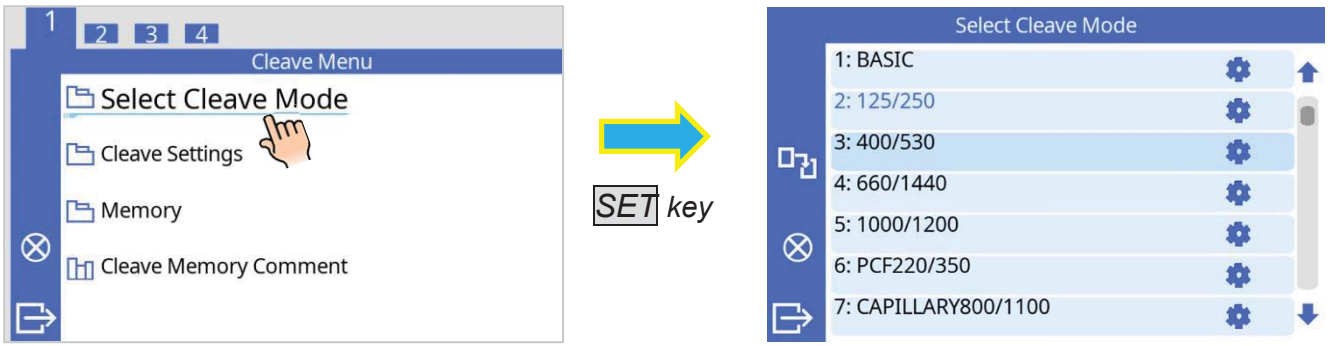
Cleave mode parameters and other settings common to all cleave modes can be chosen in this menu. Here, you can also reference cleave result memory.



Item	Description
Select Cleave Mode	*Choose cleave mode according to fiber type.*
Cleave Settings	*Set parameters that are common for all cleave modes.*
Memory	*Retrieve cleave results and associated parameters.*
Cleave Memory Comment	*Add a comment to a memory file after cleaving.*

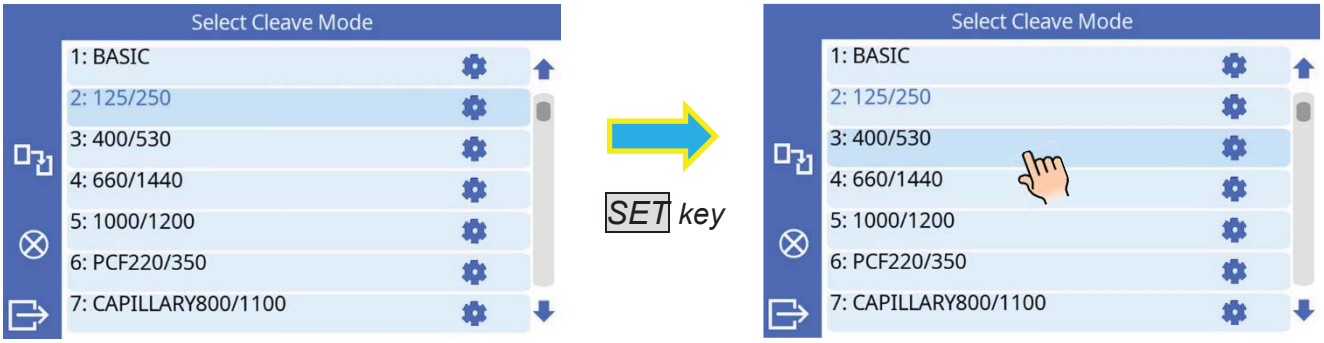
Select Cleave Mode

The cleaver can record up to 100 cleave modes. Choose and/or edit the appropriate cleave mode before cleaving.



How to change the cleave mode.

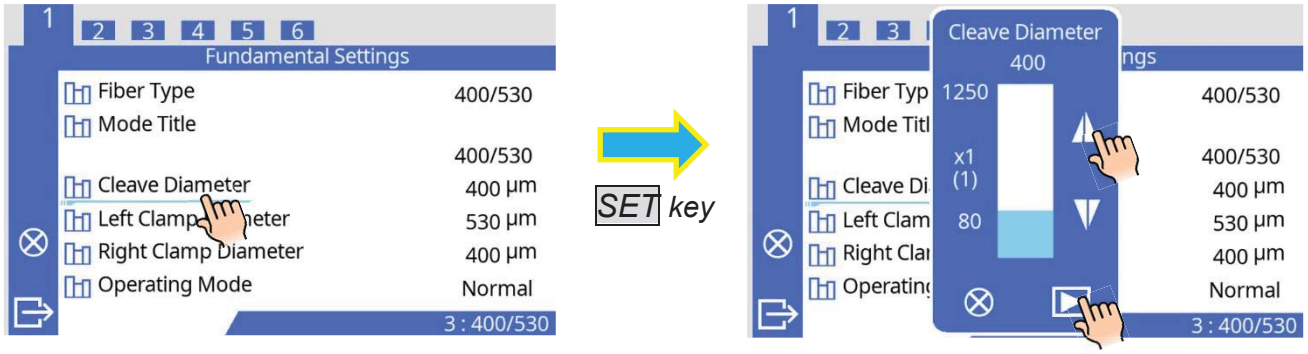
1. *Touch to select, or move the cursor by pressing the UP/DOWN key to highlight the desired mode.*
2. *Press the SET key to select a cleave mode. The cleave mode is now changed.*



Viewing or Editing Cleave Mode

Parameters in each cleave mode can be modified. To edit parameters, follow the steps below:

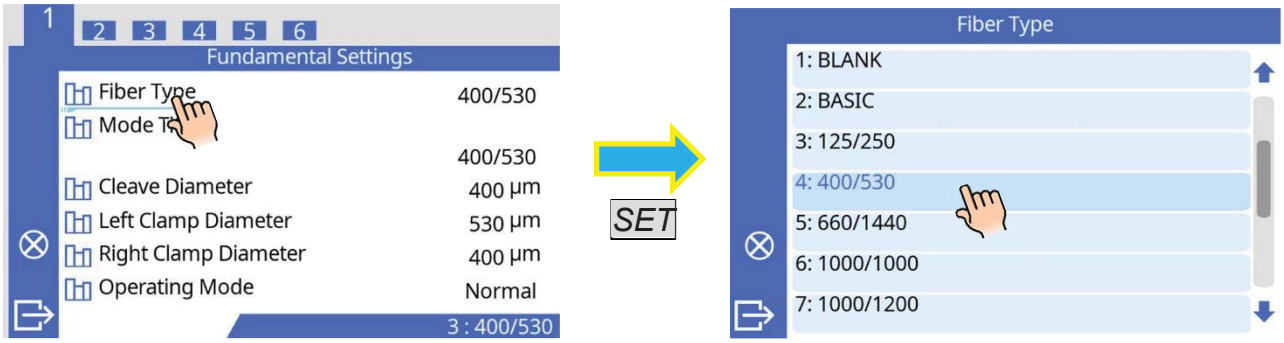
1. *In the [Cleave Mode] menu, touch the ⚙ icon or move the cursor to the cleave mode to be modified. Hold the SET key to display [Fundamental Settings].*
2. *Touch to select or move the cursor by pressing the UP/DOWN key to choose the parameter to be changed. Press the SET key to edit the parameter.*



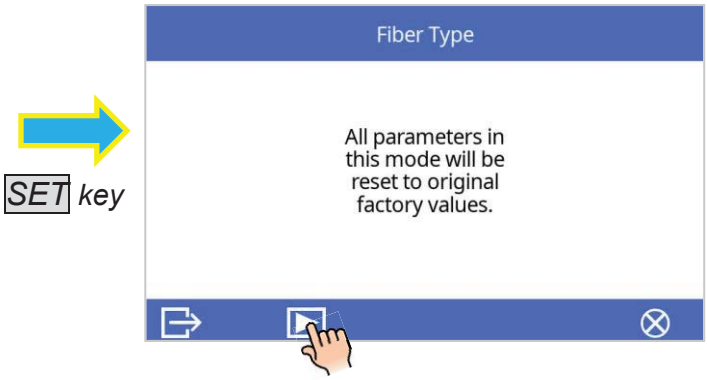
Initializing edited parameters

To return all parameters to the initial factory values after changing them, follow the steps below:

1. *Select [Fiber Type] in the [Fundamental Settings] screen and press the SET key.*
2. *Select the same fiber type.*



3. *Press the SET key one more time to reset all parameters in the cleave mode according to the factory cleave parameters.*



Creating or Erasing a Cleave Mode

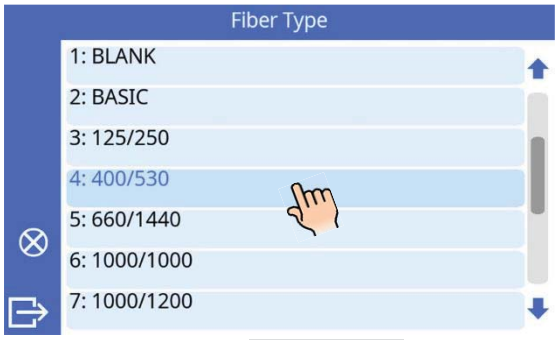
How to create a cleave mode

Standard cleave modes are available when the cleaver is delivered, and all other modes are displayed as [BLANK]. Follow the procedures below to add a new mode.

1. *Select a "BLANK" mode, then press and hold the SET key.*
   Typical cleave modes stored in the cleaver will be displayed.
   Select a cleave mode to be copied for reference, then select the new mode from the [Select Cleave Mode] menu.

Select a "BLANK" mode in [Select Cleave Mode]

SET key



Touch or use the UP/DOWN keys, then press and hold the SET key

How to delete a cleave mode

Cleave modes can be deleted. Follow the steps below to delete a cleave mode.

1. *Select the cleave mode and press and hold the SET key.*
2. *Select [Fiber Type] in [Fundamental Settings] and select "BLANK." Press the SET key.*
3. *A confirmation message will appear – press the SET key to proceed past the message.*

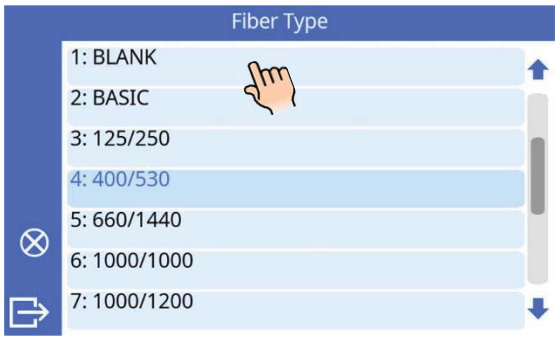
- *Mode No.1 cannot be deleted.*
- *Mode No.1 is automatically selected after deleting a cleave mode.*

Select [Fiber Type] in [Fundamental Settings]

SET key

Select "BLANK" using the UP/DOWN key, then press the SET key

Deleting a Cleave mode

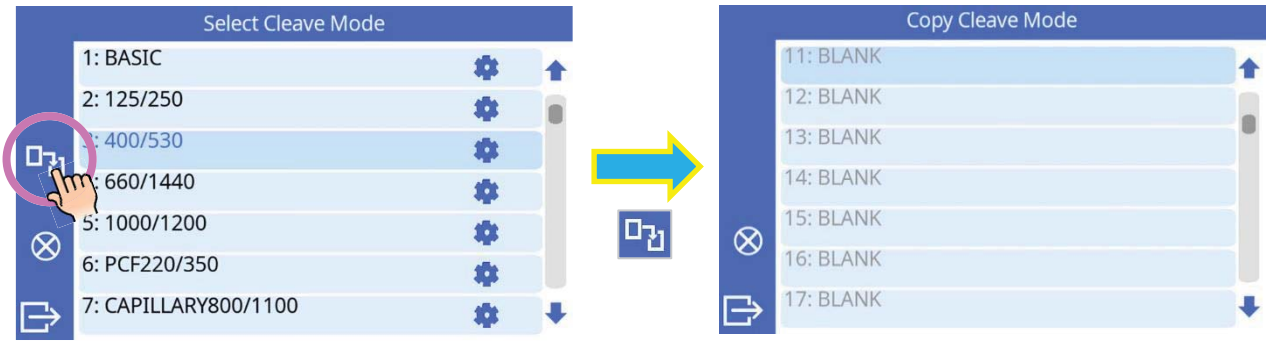


[Fiber Type] screen

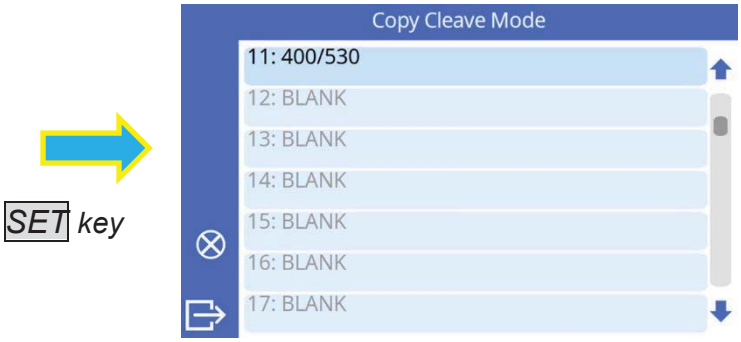
Copy a Cleave Mode

You can copy a cleave mode to a new slot by following the steps below:

1. *In the [Cleave Mode] menu, select the cleave mode you want to copy, then press the*  *icon to display the [Copy Cleave Mode] screen.*



2. *Touch to select, or move the cursor by pressing the UP/DOWN keys, then press the SET key to copy the previously selected cleave mode into the new slot.*

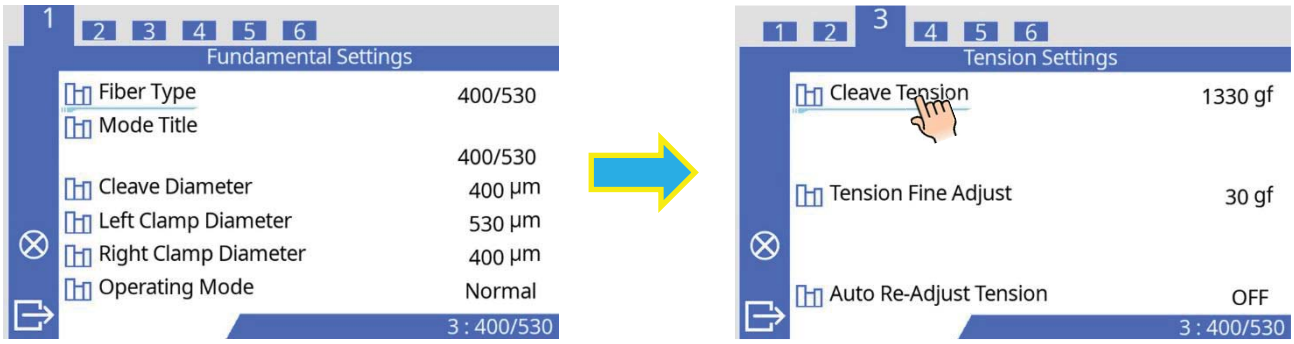


➢ *If you select a cleave mode which already exists, the cleaver will display the following warning.*

Cleave Mode Parameters

Cleave modes consists of the following parameters.

- *Clamp Control Parameters*
- *Fiber Tension Parameters*
- *Cleaving Blade Control Parameters*



Fundamental Settings

The parameters of the fibers to be cleaved are in the table below.

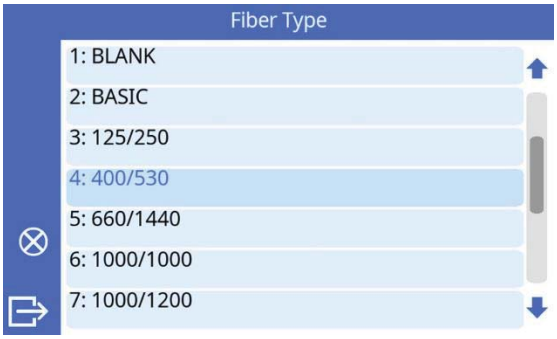
Parameter	Description
Fundamental Settings	
Fiber Type	*Display the stored list of fiber types. The selected fiber type stored in the database is copied to the "Selected Fiber Type" slot in the user-programmable area.*
Mode Title	*Input a cleave mode title with up to 21 characters.*
Cleave Diameter	*Sets the diameter of the fiber to be cleaved. The cleaver will change the fiber tension based on the value of this parameter.*
Left Clamp Diameter *Right Clamp Diameter*	*Sets the fiber diameter values for each clamp. When these parameters are changed, check the insert names displayed on the [READY] or [RESET] screen. Confirm that the correct inserts are installed in each clamp.*
Operating Mode	*[Normal]: This is the standard mode. The cleaver tensions the fiber before the blade scores the fiber. Select this mode for normal operation.* *[Special]: If selected, the [Special Setting] menu appears and the cleaver operation will change. The cleaver will score the fiber at a lower tension, then increase the tension until the fiber cleaves. Refer to the "Technical Reference" manual before using this mode.*

When the [Cleave Diameter] is changed, the [Cleave Tension] and [Left/Right Clamp Diameter] are automatically changed to the recommended values.

When the [Left/Right Clamp Diameter] is changed, the [Left/Right Clamp Force] is automatically changed to the recommended value.

Fiber Type

In [Fiber Type] you can set up a cleave mode based on the information for fibers listed in the table below. Select the closest cleave mode to the fiber to be cleaved.



Cleave Mode	Description
BLANK	*This option will erase the cleave mode parameters.*
BASIC	*This mode should be used to optimize cleaving parameters according to the fiber. Some parameters will be adjusted automatically by [Cleave Diameter] or [Left / Right Clamp Diameter].*
125/250	*This cleave mode can cleave 125μm clad / 250μm coated fiber.*
400/530	*This cleave mode can cleave 400μm clad / 530μm coated fiber.*
660/1440	*This cleave mode can cleave 660μm clad / 1440μm coated fiber.*
1000/1000	*This cleave mode can cleave 1000μm clad fiber*
1000/1200	*This cleave mode can cleave 1000μm clad / 1200μm coated fiber.*
PCF220/350	*This cleave mode can cleave 220μm clad / 350μm coated PCF.*
CAPILLARY800/1100	*This cleave mode can cleave 800μm inner diameter / 1100μm outer diameter capillary tubing.*
400 / 530 ANGLED ※*CT116 only*	*This cleave mode can provide an 8 degree angled cleave for 400μm clad / 530μm coated fiber.*

How to select the Cleave Mode

- ***[BASIC]***
  If a cleave mode for your fiber does not exist, select this mode and optimize the cleave paramerers for cleaving your fiber.

- ***[125/250] etc***
  These modes are named using the system: (Cladding Diameter) / (Buffer or Coating Diameter). These modes are to cleave the corresponding diameter of fiber.

- ***[PCF]、[CAPILLARY] etc***
  These modes are to cleave PCF (Photonic Crystal Fber) and Capillary Tubing.

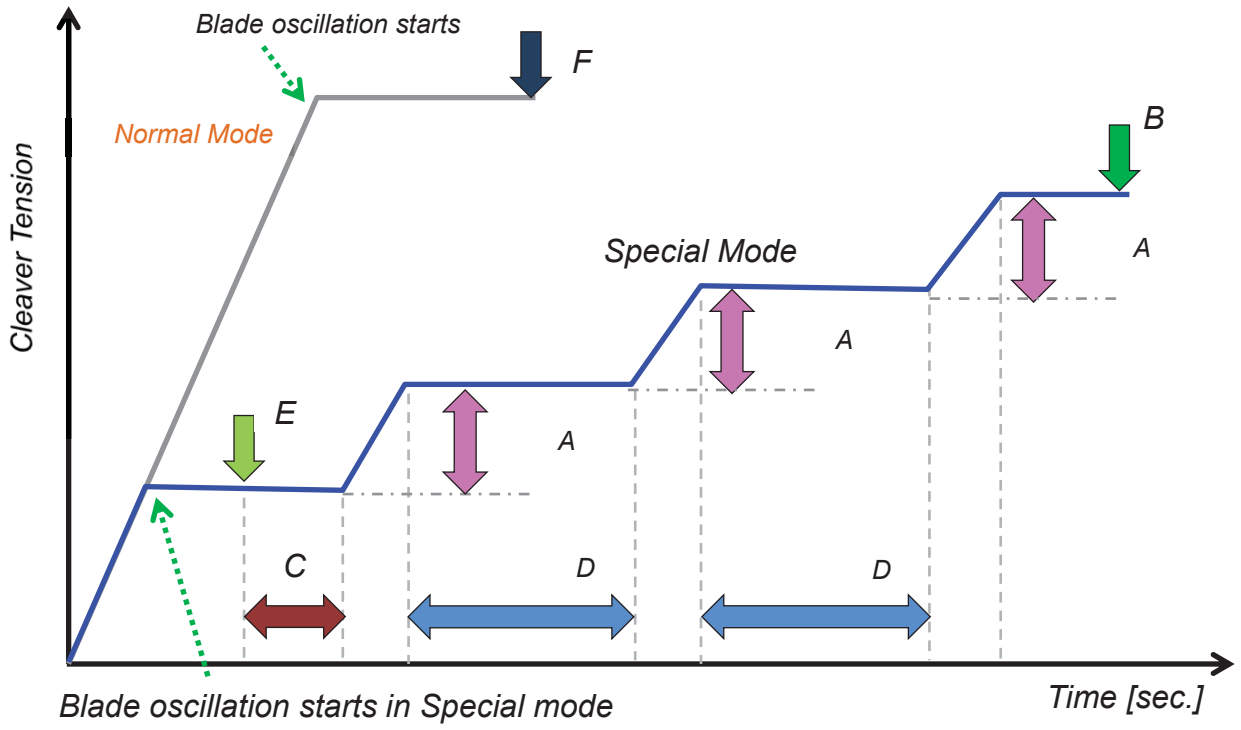
Special Settings

This parameter is displayed when the cleave mode is changed from "Normal" to "Special". Unlike the "Normal" mode, the special mode can cleave the fiber, leaving fewer scores from the cleaving blade.

Parameter	Description
Special Settings	
Re-Tension Step	*Sets the tension increment value during special mode operation.*
Re-Tension Limit	*Sets the cleave tension limit value during the special mode. Indicates the increment from the [Cleave Tension]. ex) When [Cleave Tension is "500gf", apply the tension up to"750gf"*
Wait After Oscillation	*Sets the wait time after the blade oscillations until the cleaver starts increasing the tension in special mode.*
Wait After Re-Tension	*Sets the wait time between tension increments in special mode.*

Cleaver operation modes

The figure below shows the difference between cleaver operation in "Normal" mode or "Special" mode.



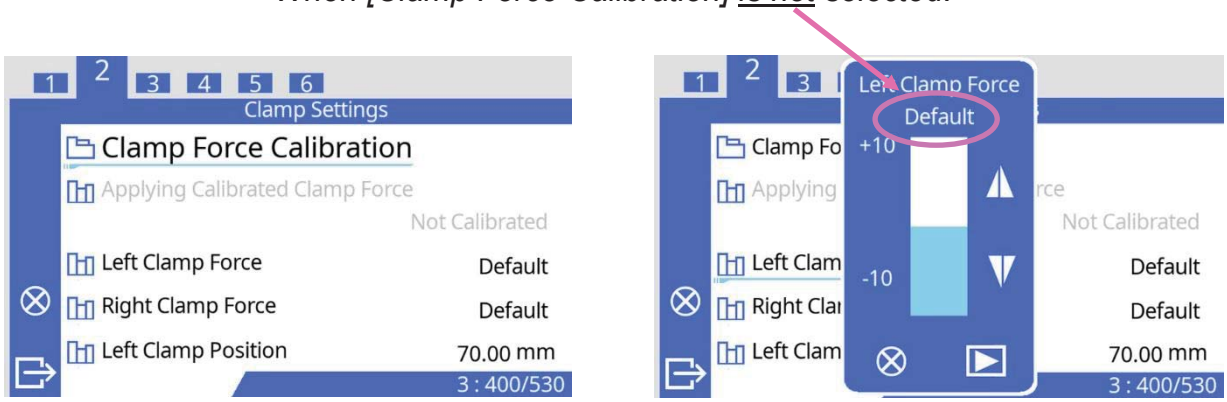
A : *Re-Tension Step [gf]*
B : *Re-Tension Limit [gf]*
C : *Wait After Oscillation [sec.]*
D : *Wait After Re-Tension [sec.]*
E : *Blade scores the fiber and the blade oscillation finishes in "Special Mode".*
F : *The cleaver scored the fiber sufficiently, the fiber will break and the cleaving operation is finished in "Normal" mode.*

Clamp Settings

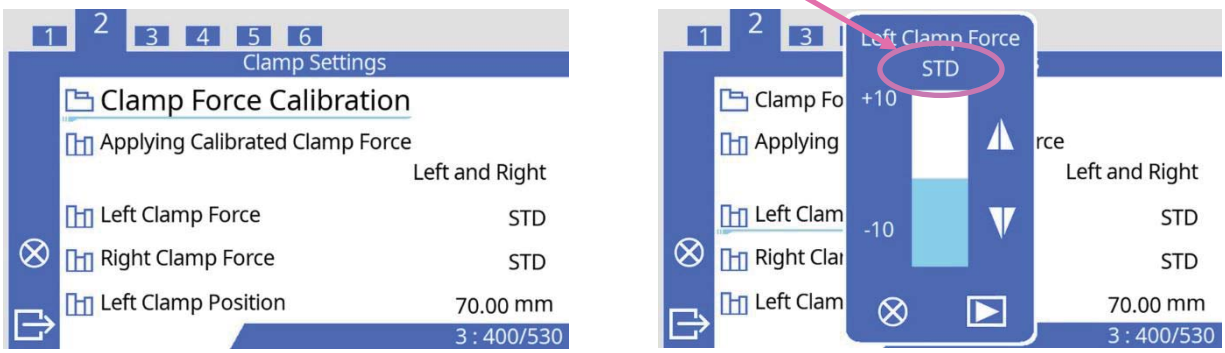
The left and right clamp force can be set independently of each other.
The recommended clamp force is automatically set by the input cleave diameter.
By adjusting clamp force, the cleaver can learn the actual parameters

Parameter	Description
Clamp Settings	
Clamp Force Calibration	*Adjust the clamp force to match the fiber diameter.* *After calibration, the clamp force is displayed as "STD".*
Applying CalibratedClamp Force	*Select the whether or not to apply the clamp force set in the [Clamp Force Calibration].* *Select either [Default], [Left and Right], [Right Only], or [Left Only].* *If [Clamp Force Calibration] is not executed, this parameter will display "Default"*
Left/Right Clamp Force	*Sets the clamp force for either clamp.* *When the [Calibrated Clamp Force] is applied, "STD" is displayed.* *When the [Calibrated Clamp Force] is not applied, "Default" is displayed.* *Clamp force for both clamps can be adjusted here.*
Left Clamp Position	*Sets the distance between right edge of the left clamp and cleaving blade.*

When [Clamp Force Calibration] is not selected:



When [Clamp Force Calibration] is selected

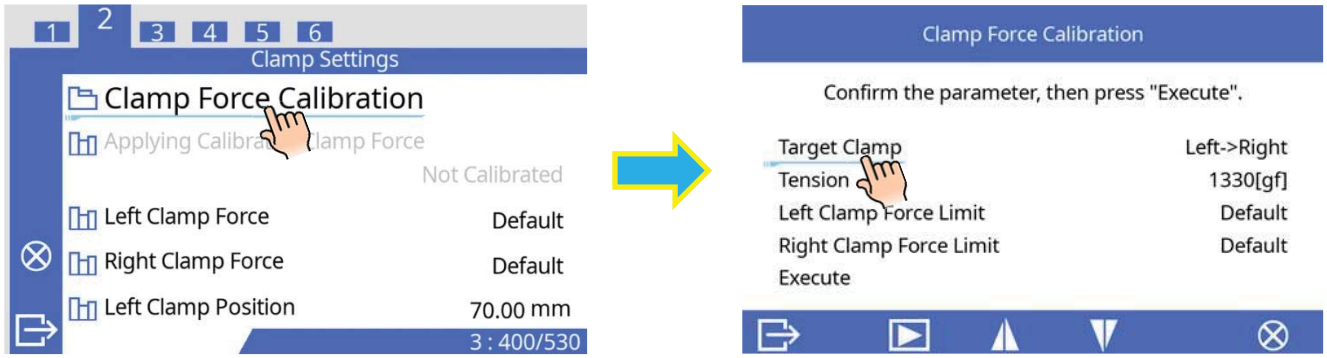


Clamp Force Calibration

The clamp force may vary based on the outer coating type, cladding material, or construction of the fiber. If you use this function, the cleaver will automatically measure the appropriate clamp force.

Overview of Clamp Force Adjustment

Select "Clamp Force Calibration" and press the SET key to display the [Clamp Force Calibration] screen.



In the [Clamp Force Calibration] screen, select "Execute" and press the SET key to start the calibration.

Parameters	Description
Target Clamp	*Sets the orders of the calibration.* *Selects [Left -> Right] by default.*
Left Clamp Force Limit *Right Clamp Force Limit*	*Sets the maximum value of Clamp Force during automatic calibration. If the clamp force needs more than this maximum value, an error message will be displayed.*
Tension	*Sets the clamp force during automatic calibration* *The user can set this to any value.*

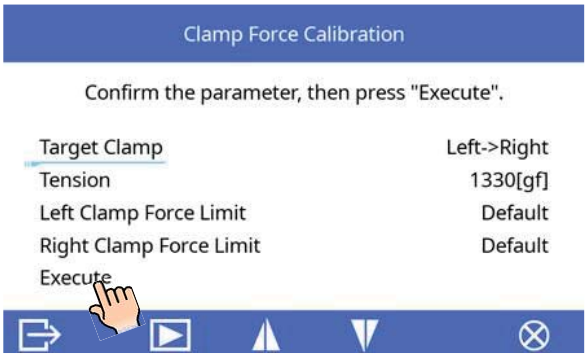
Procedure for Clamp Force Calibration

The following preparation is necessary before calibration.

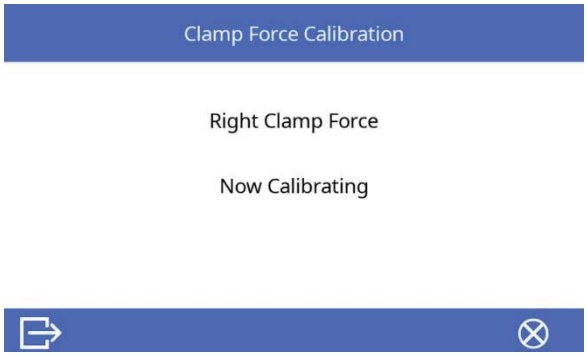
- *Prepare the fiber to be used for calibration. Measure the outer coating and cladding diameter, and input the appropriate values for "Cleave Diameter" and Left/Right Clamp Diameter".*

1. *If the fiber is already loaded, remove the fiber.*
2. *Select "Clamp Force Calibration" under [Clamp Settings], and press the SET key.The [Clamp Force Calibration] screen will be displayed.*

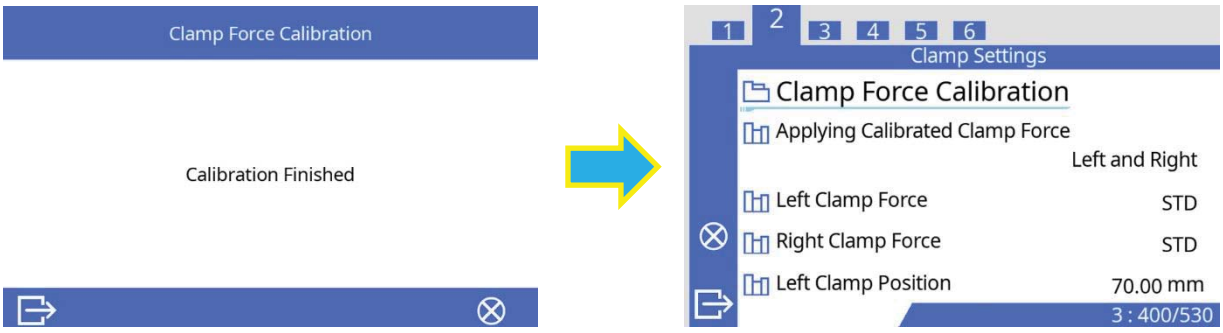
3. *Pressing the SET key will cause the clamp unit to move its original position. Set the clean fiber on the cleaver.*



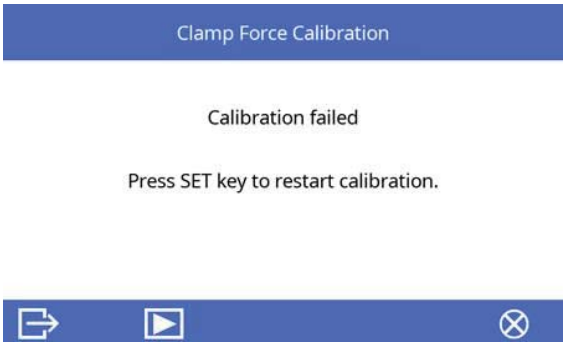
4. *After loading the fiber, press the SET key to execute the calibration.*



5. *After calibration is done, press the SET key to save the calibrated value. After saving, "STD" will be displayed on the monitor.*

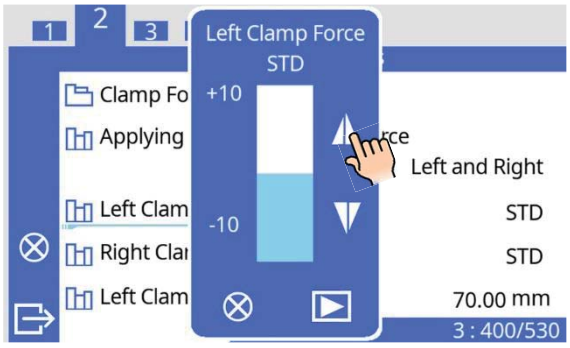


6. *If calibration is not successful, the "Calibration Failed" message will be displayed. Follow the instructions on the screen, and execute the calibration again with a new fiber.*



When errors occur

1. *Re-confirm the clamp force of the left and right clamp. Change the value of the Left/Right Clamp Force by executing the Clamp Force Calibration again.*



2. *If you apply a high clamp force to capillary tube, PCF, etc,, the fibers may break. In this case, clean the inserts and reduce the maxmum clamp force to improve the result.*

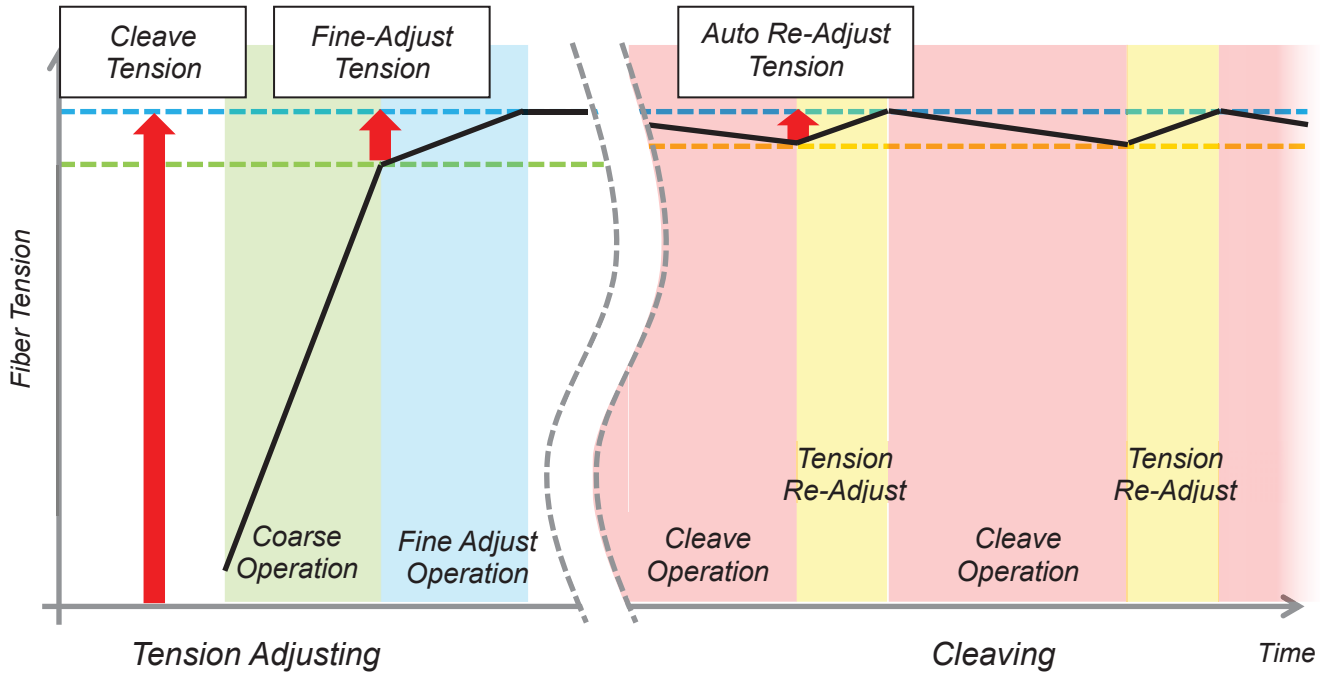
3. *Changing the insert size, mounting, cleaning, etc. may also be effective for good results.*

Tension Settings

The tension force and related parameters can be set.

Parameter	Description
Tension Settings	
Cleave Tension	*Displayed the calculated tension from the cleaving diameter. This parameter can be changed.*
Tension Fine Adjust	*Sets the threshold for the cleaver to switch from coarse to fine adjusting.*
Auto Readjust Tension	*Sets the tension loss threshold for starting to re-adjust the tension. If set to "OFF", the cleaver will not re-adjust tension.*

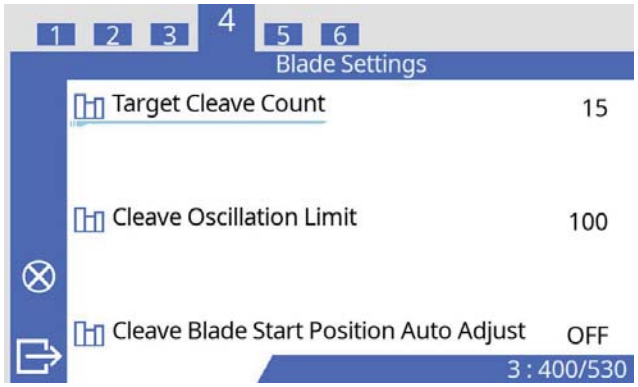
The following figure shows the fiber tensioning process.



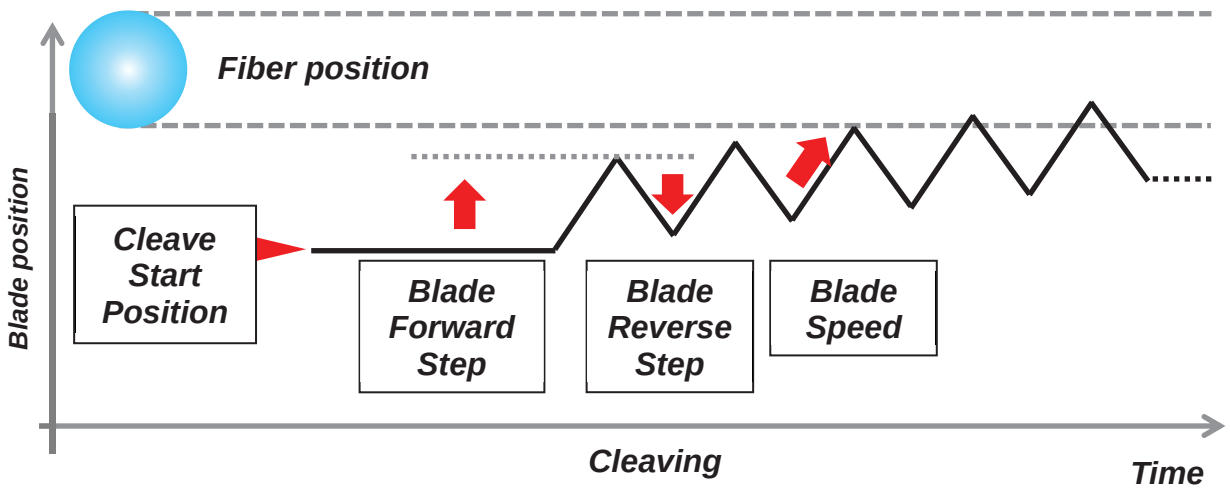
Blade Settings

The parameters of the cleaving blade can be set.

Parameter	Description
Blade Settings	
Blade Speed	*Sets the speed of cleaving blade during oscillation.*
Blade Forward Steps	*Sets the cleaving blade forward distance. This parameter cannot be set smaller than "Blade Reverse Steps."*
Blade Reverse Steps	*Sets the cleaving blade reverse distance. This parameter cannot be set larger than "Blade Forward Steps".*
Blade Approach Steps	*Shows the value: Blade Forward Steps – Blade Reverse Steps*
Target Cleave Count	*Sets the blade oscillation count until the fiber should be cleaved.*
Cleave Oscillation Limit	*Sets a limit on the number of times the blade may oscillate.*
Cleave Blade Start Position Auto Adjust	*If set to "ON", the cleave count will be adjusted to the "Target Cleave Count" with each oscillation.* *If set to "OFF," the cleaver does not adjust the cleave count.*



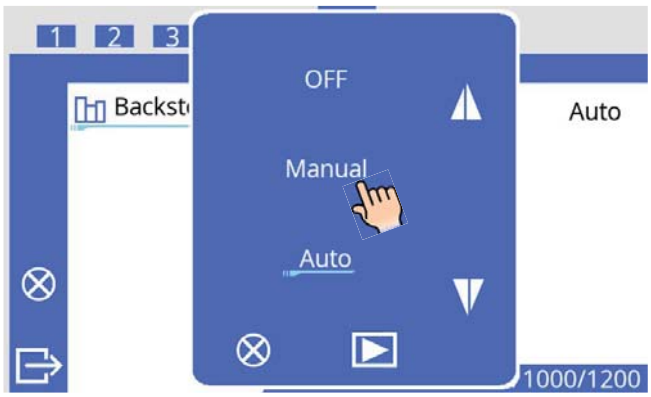
The blade motion during the cleave is shown below.



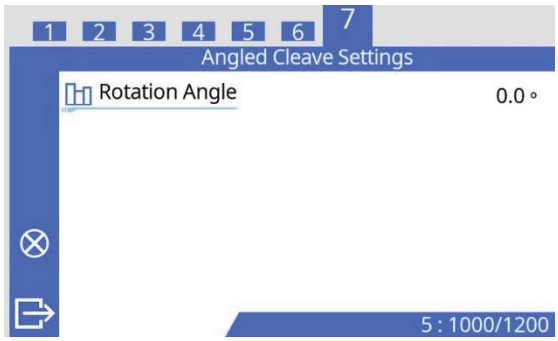
Backstop / Angled Cleave Setting

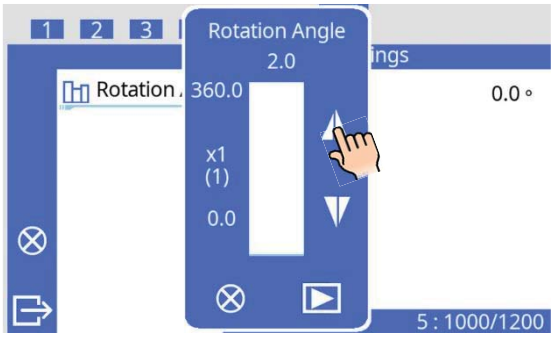
The backstop parameter can be set to OFF, Manual, or Auto.
**Only the CT116 has the Angled Cleave Setting. CT115 cannot do angled cleaves.*

Parameter	Description
Backstop Settings	
Backstop Set Mode	*Switches the backstop OFF, Manual, and Auto.*



Angled Cleave Settings (CT116 only)	
Rotation Angle	*Sets the rotation angle of the right clamp when cleaving*

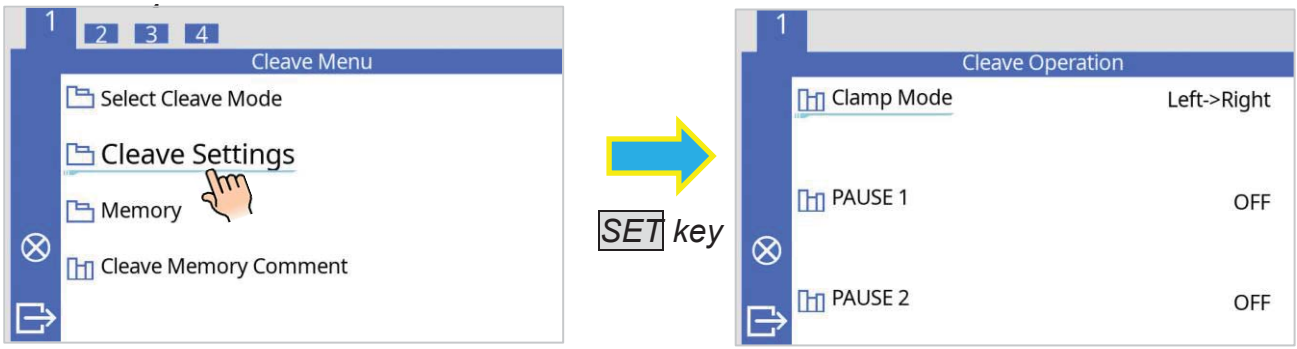




Cleave Settings

Parameters common to all the cleave modes can be set.

1. *Select "Cleave Settings" in the [Cleave Menu] and press the SET key.*
2. *Touch or move the cursor to select a parameter, then press the SET key.*
3. *Change value by touch or by pressing the UP/DOWN key, press SET key to save.*



Parameter	Description
Cleave Settings	
Clamp Mode	*Sets the order of clamp tightening.* *Left->Right* *Left clamp will be tightened first, then the right clamp will be tightened. If "Pause 1" is set to "ON", the cleaving operation will pause before the right clamp is tightened.* *Right->Left* *Right clamp will be tightened first, then the left clamp will be tightened. If "Pause 1" is set to "ON", the cleaving operation will pause before the left clamp is tightened.* *Left & Right* *Both left and right clamps are tightened simultaneously.*
Pause 1	*If "Pause 1" is set to "ON", the cleaving operation will pause after the first clamp is tightened.* **This parameter does not apply when "Clamp Mode" is set to "Left & Right".*
Pause 2	*If "Pause 2" is set to "ON", the cleaving operation will pause after both clamps are tightened.*

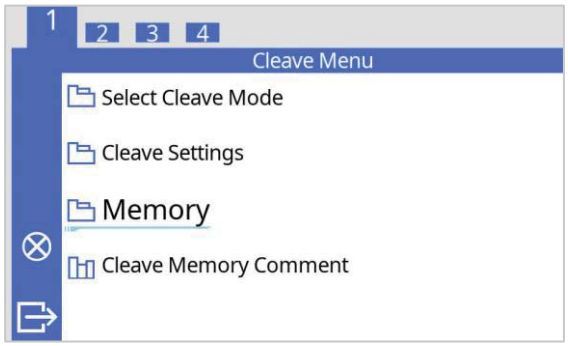
Clamp Mode

Setting "Clamp Mode" to "Left & Right" may cause fiber to twist during clamping, depending on the fiber. Fiber twist may cause a bad cleave. In this case, "Clamp Mode" should be set to "Left->Right" or "Right->Left".

Cleave Result Memory

This Cleaver stores up to 10,000 cleave results. The following data are automatically stored in the memory.

- *Cleave Mode*
- *Cleave Parameters*
- *Cleave Errors*
- *Cleaving Blade Condition*
- *Stored Date*

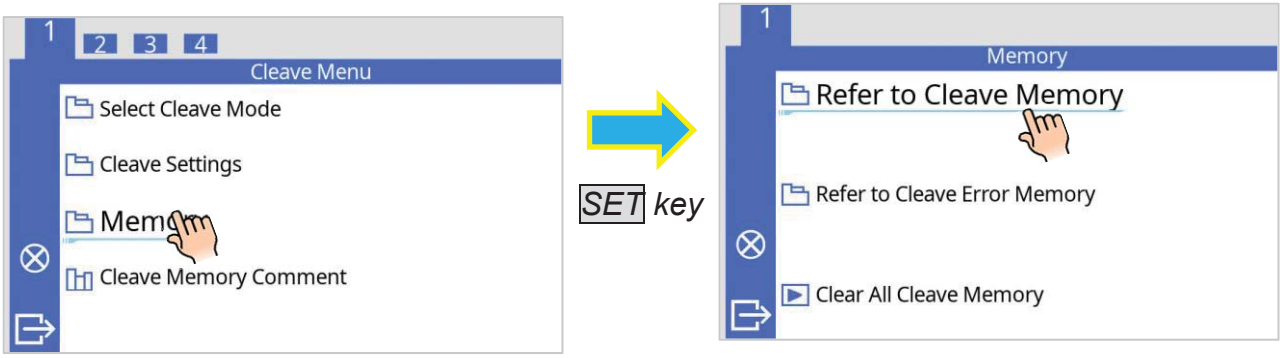


Referring to or Erasing Cleave Results

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

How to display cleave result data

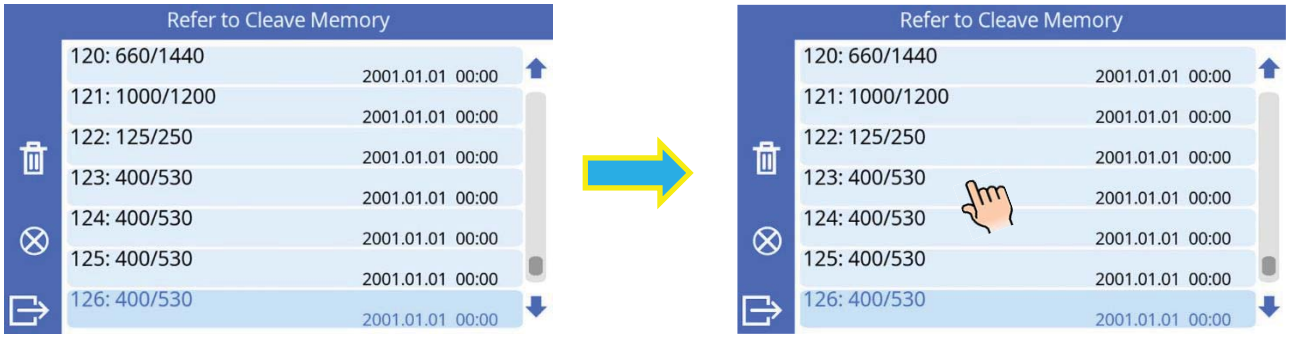
1. *Select [Memory Menu] in [Cleave Menu] and select [Refer to Cleave Memory].*



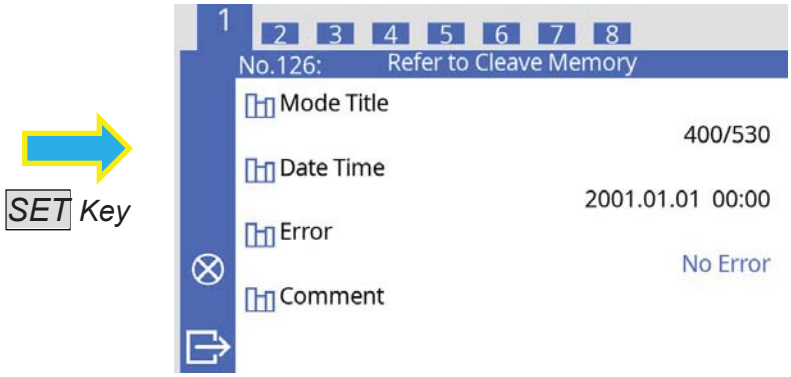
➢ *Memory data can be downloaded with the "Data Connection" software.*

2. *The list of cleave results will be displayed. The memory can be selected by following two methods.*

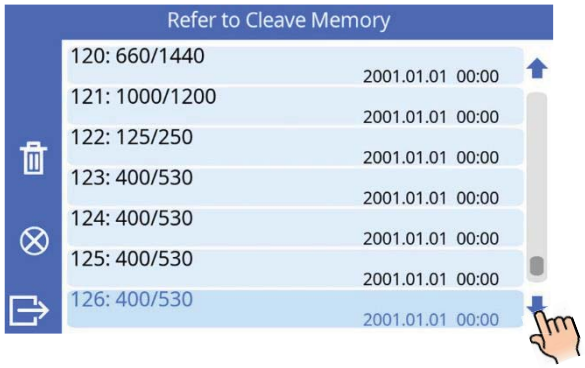
1) Move the cursor to a memory file and press the SET key.



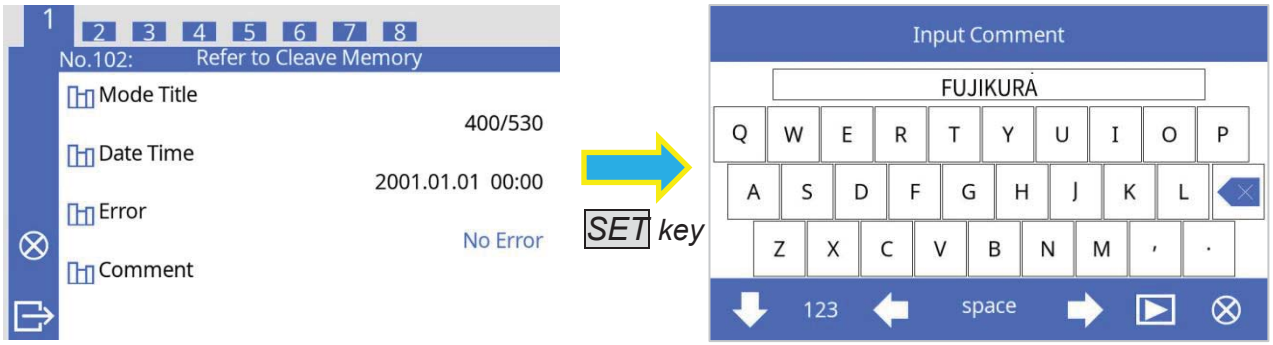
Select using the UP/DOWN keys, then press the SET key

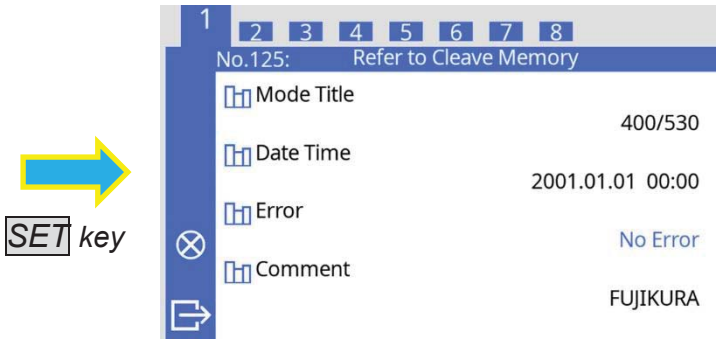


2) Move the slider on the right side to scroll the pages.



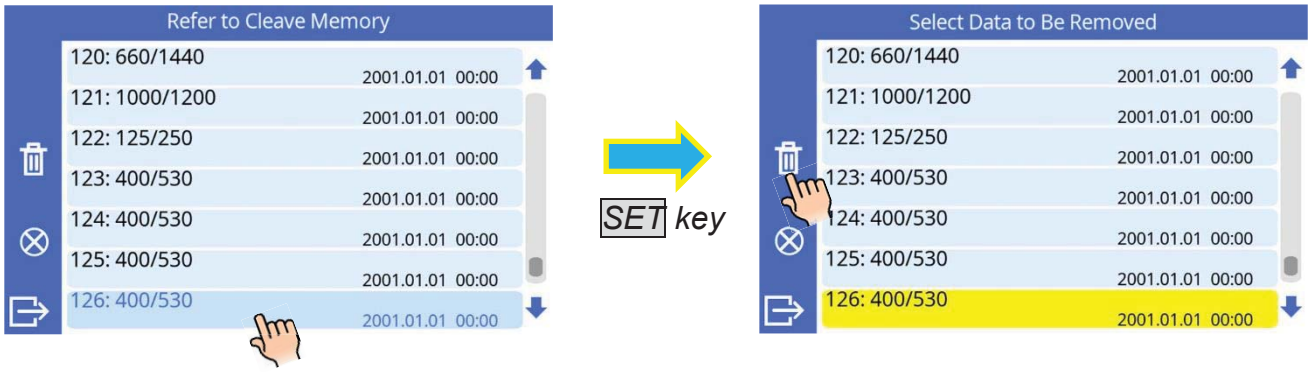
3. *For adding or editing comments, press the SET key to display the [Input Comment] screen.*

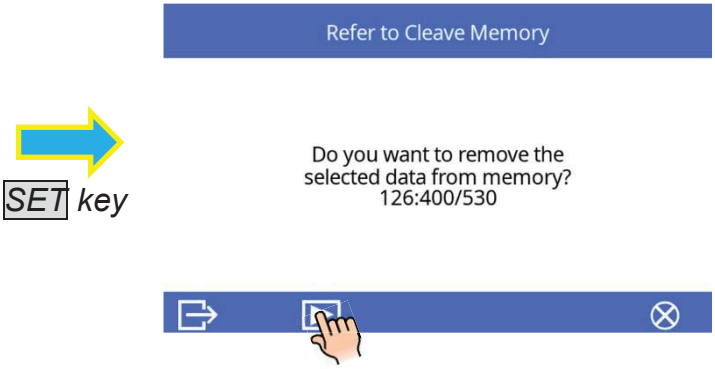




How to delete cleave result data

1. *In [Refer to Cleave Memory] screen, move the cursor and select the memory file to be deleted.*

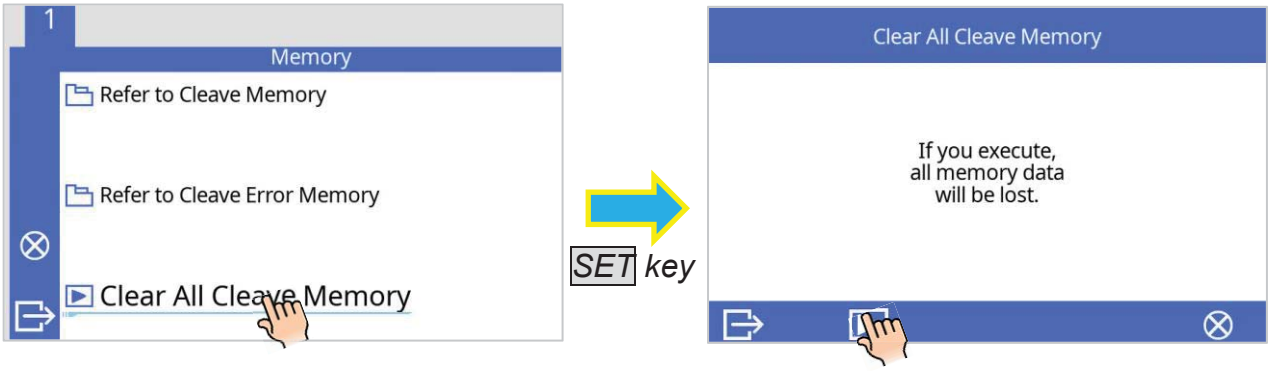




Clear all cleave result data

All cleave results can be cleared at once.

1. *Move cursor to "Clear All Cleave Memory" in the [Memory] menu and press the SET key.*
2. *Press the SET key again to clear all cleave result data.*



Referring to Cleave Results with Error Message(s)

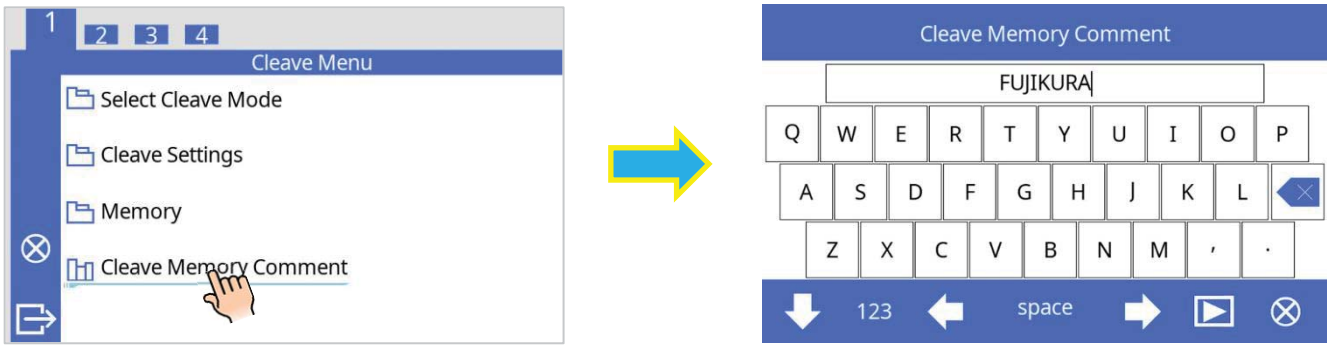
Cleave results having some error are shown. The operation to refer to and erase these memories is the same as the "Refer to Cleave Memory" process.

1. *Select "Refer to Cleave Error Memory" and press the SET key in the [Memory] screen.*
2. *The cleave results with error will be displayed.*
3. *Operations can be performed the same way as the [Refer to Cleave Memory] process.*

Cleave Memory Comment

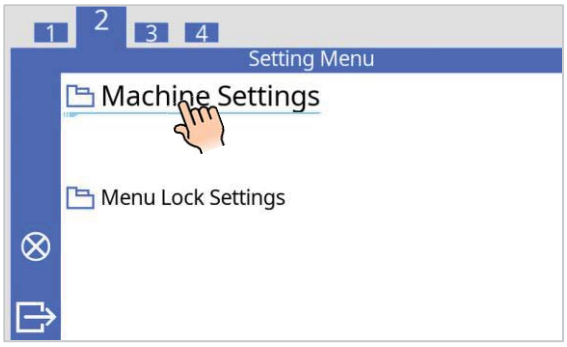
When a "Cleave Memory Comment" is set, the cleave result is commented automatically. "Cleave Memory Comment" is not set when the cleaver is delivered.

1. *Select "Cleave Memory Comment" and press the SET key in the [Cleave Menu] screen.*
2. *Input a comment.*



Settings Menu

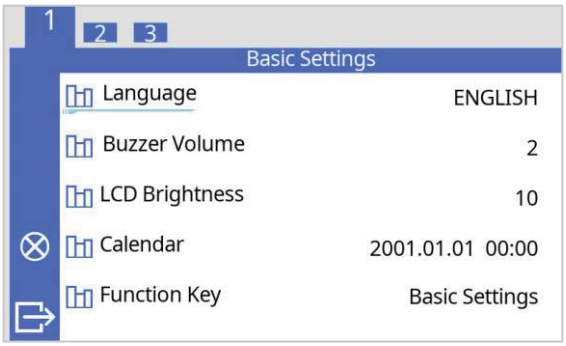
The configuration of machine can be changed in the [Settings Menu] screen.



Item	Description
Machine Settings	*Changes the settings related to the operation of the cleaver itself*
Menu Lock Settings	*Allows certain functions to be restricted by an administrator.*

Machine Settings

The parameters related to basic operation of the cleaver itself can be changed.



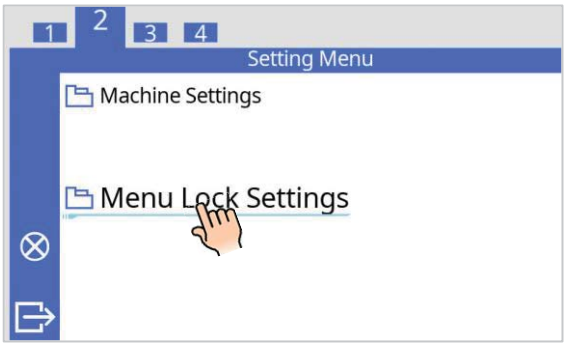
1. *Select "Machine Settings" in the [Setting Menu] and press the SET key.*
2. *Select an item to be changed. Press SET key to edit a setting.*
3. *Change value using the UP/DOWN keys, then press the SET key to save.*

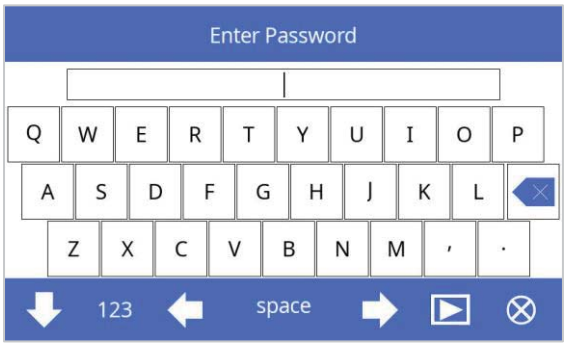
Machine Settings

Item	Description
Basic Settings	
Language	*Sets the language used on the cleaver.*
Buzzer Volume	*Sets the volume of the buzzer.*
LCD Brightness	*Adjusts the brightness of the screen.*
Calendar	*Sets the date/time on the cleaver.*
Function Key	*By default, the Fn key shortcut is set to "Basic Settings" under the [Settings Menu].* *Use the "Function Key" settings under "Basic Settings" to assign a menu shortcut to the Fn key.*
Power Saving Timer	
Sleep	*Sets the sleep time for the monitor and sets the time for automatically turning off the cleaver.*
Shut Down	
Cleaver Blade Alarm	
Warning Alarm	*When the number of cleaves exceeds the selected [Warning Alarm] value, the following warning message is displayed.* *[Blade Position] is at "20":* *The operator will be prompted to replace the cleaver blade* *[Blade Position] is below "20":* *The operator will be prompted to change the blade position.* *If [Warning Alarm] is set to "OFF", warning does not display.*

Menu Lock Settings

Supervisors can limit available functions/parameters using [Menu Lock Settings].



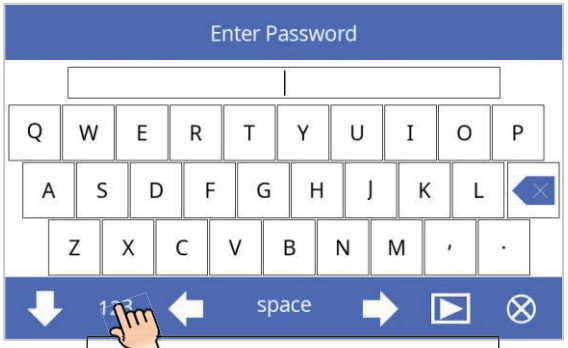


1. *Select "Menu Lock Settings" in [Settings Menu] and press the SET key.*
2. *Enter the password set in "Menu Lock Password".*
   ** Refer to the table below.*

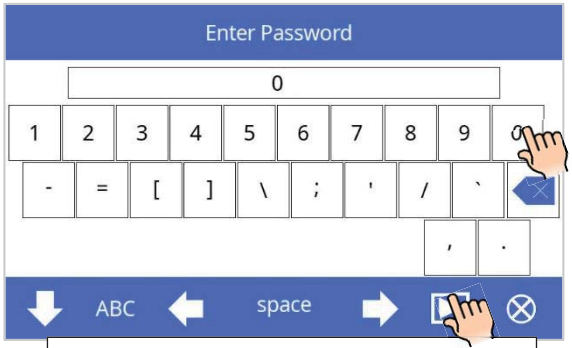
Item	*Description*
Password Setting	
Menu Lock Password	*Changes the password to access the [Menu Lock Settings].* *Password is "0" when the cleaver is delivered.*
Cleave Mode	
Select Cleave Mode	*Setting to "Disable" prevents unauthorized editing and/or selection of cleave modes.*
Edit Cleave Mode	
Memory	
Clear All Cleave Memory	*Setting to "Disable" prevents unauthorized deletion of memory data.*
Cleave Settings	
Cleave Operation	*Setting to "Disable" prevents unauthorized editing of cleave settings.*
Machine Settings	
Basic Settings	*Setting to "Disable" prevents unauthorized editing of the [Machine Settings] menu.*
Power Saving Timer	
Cleaver Blade Alarm	
Maintenance	
Touchscreen Calibration	*Setting to "Disable" prevents operation of functions within the [Maintenance Menu].*
Blade Adjustment	
Blade Replacement	
Fiber Holder Adapter installation	
Blade Position Confirmation	
Diagnostic Test	
Blade Management	
Fiber Holder Management	

How to enter “Menu Lock Settings”

1. Select “Menu Lock Settings” in the [Settings Menu] screen and press the SET key.
2. “Enter Password” screen will appear. Input the password using the keypad.
3. After entering the password, press the ▶ or the SET key.



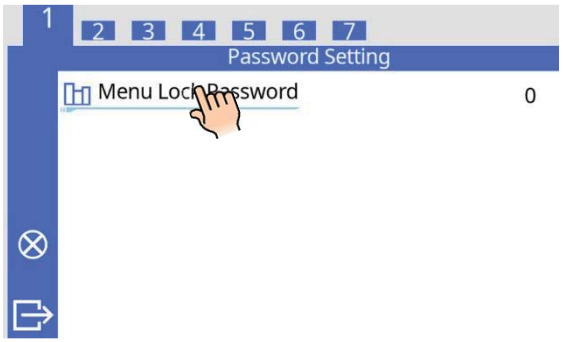
Input password: ”0”



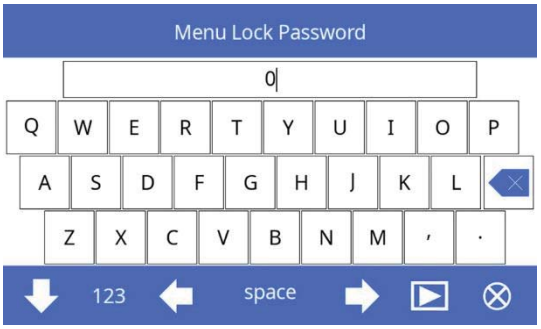
Press SET key to execute

➢ Password is set to “0” when the cleaver is delivered.

4. When the password is correct, the “Password Setting” screen appears.
   If the password is incorrect, you will go back to the “Settings Menu” screen automatically.



Correct Password



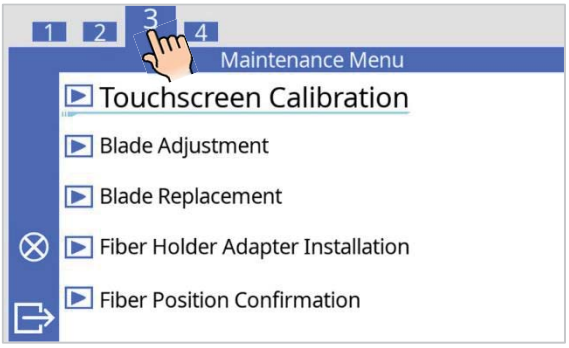
Set a new password

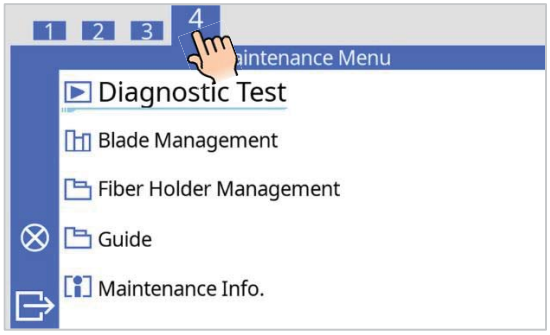
➢ If you forget the password, contact the nearest Fujikura authorized distributor.

Composition of Maintenance Menu

The cleaver provides the ability for users to perform routine maintenance. This section describes how to use the maintenance menu to maintain your cleaver.

1. *Press the DOWN key from the [READY] or [RESET] state to enter the main menu.*
2. *Navigate to third and fourth tabs to display the [Maintenance Menu].*
3. *Select a function to perform by pressing the SET key.*





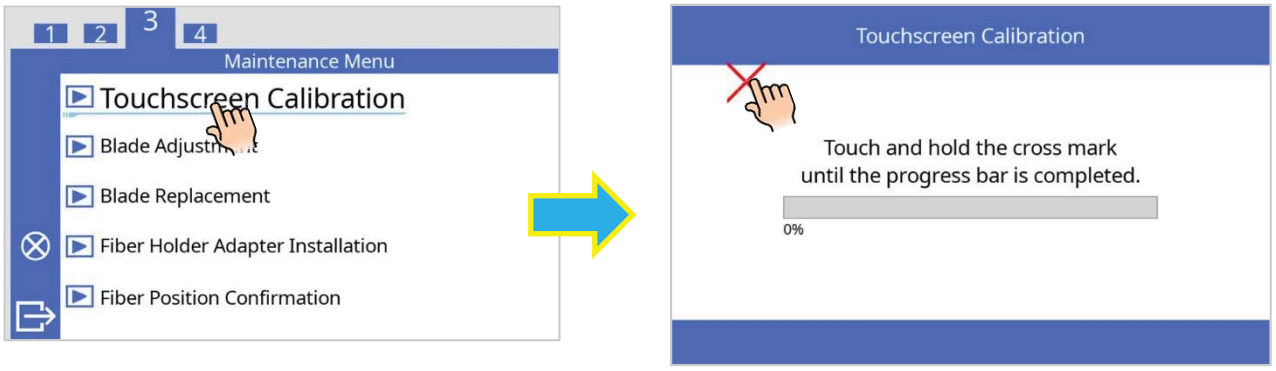
Item	*Description*
Touchscreen Calibration	*Calibrates Touchscreen.* *Follow the on-screen instructions to perform calibration.*
Blade Adjustment	*Performs the blade position adjustment.*
Blade Replacement	*This function is used when replacing the cleaver blade.*
Fiber Holder Adapter Installation	*This function is used to install the Fiber Holder Adapter.*
Fiber Position Confirmation	*This function is used to confirm the left and right clamp alignment positions.*
Diagnostic Test	*Built-in diagnostic test is performed.*
Blade Management	*This function is used to both change the blade position and confirm the cleave count at each blade position.*
Fiber Holder Management	*This function is used to register new fiber holders and to view the registered fiber holder.*
Guide	*This function shows the built-in instruction manual.*
Maintenance Info.	*Maintenance information and general information about the cleaver is shown.*

Touchscreen Calibration

This function enables calibration of the touchscreen.
Use this function if the touchscreen does not respond when you press it

Procedure

1. *Select [Touchscreen Calibration] in the [Maintenance Menu].*
2. *The screen will change and will display instructions. Follow the instructions to complete the touchscreen calibration.*



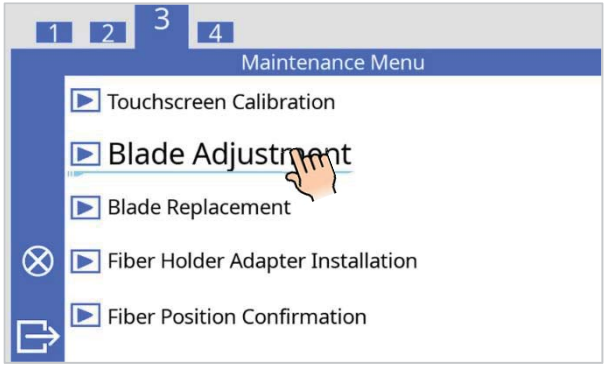
Blade Adjustment

This function is used to adjust the position of cleaving blade. After the cleaving blade is replaced, perform this procedure to calibrate the blade position.

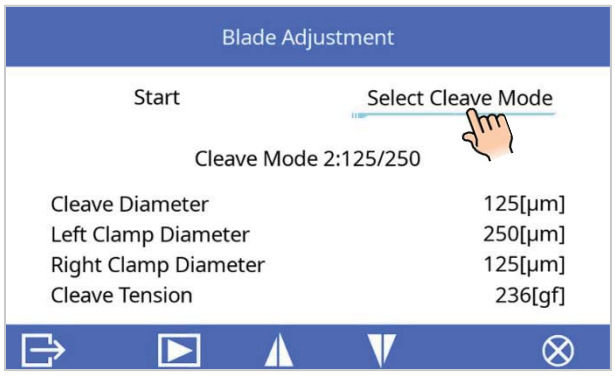
➢ *This function is included in "Blade Replacement".*

Procedure

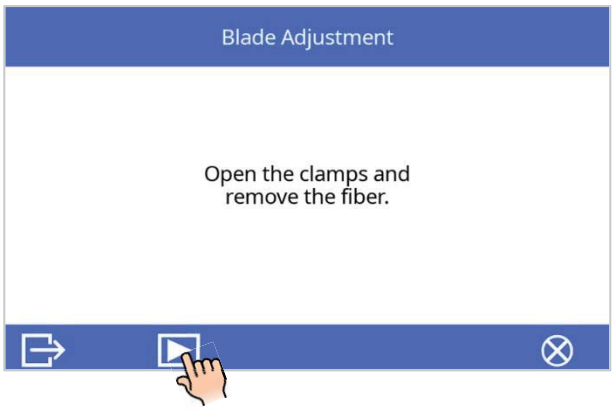
1. *Select [Blade Adjustment] in the [Maintenance Menu] and press the SET key.*



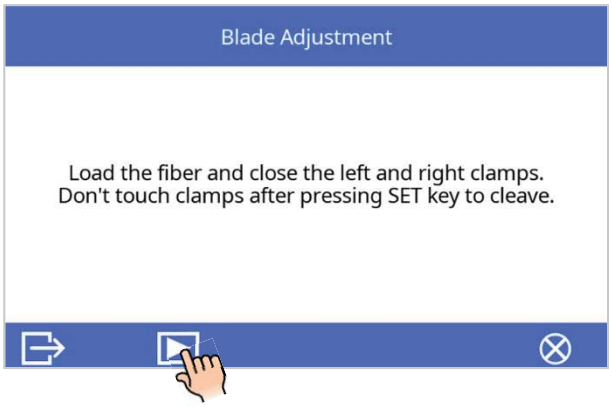
2. *On the following screen, select the appropriate cleave mode for adjustment and press the SET key.*



3. *When the following message is shown, confirm that fiber is not loaded in the cleaver and press the SET key. Cleaver will "Reset."*



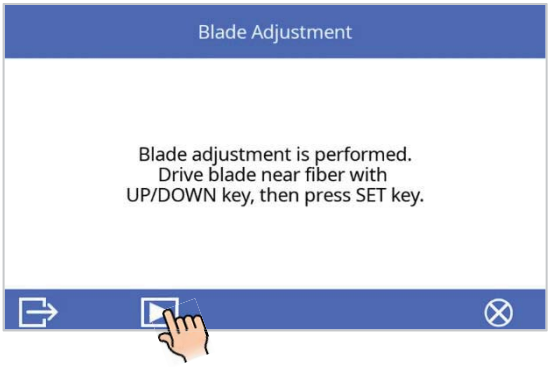
4. *When the following message is shown, load the fiber and press the SET key. Clamps are tightened and tension is added to the fiber automatically.*



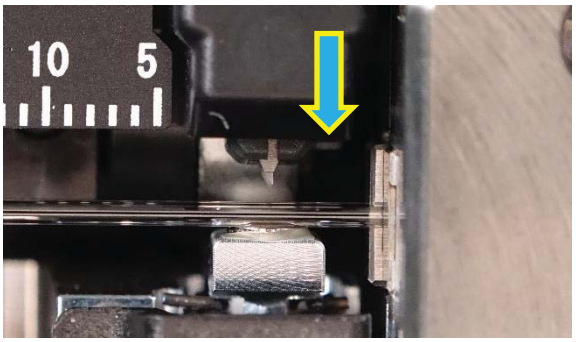
➢ *Clamp force and fiber tension are applied according to the selected cleave mode*

➢ *Do not touch clamps or fiber after tension is applied to the fiber.*

5. *After tension is applied to the fiber, the following message will be shown:*



Press the UP key to move the cleaving blade near the fiber. The final adjustment will performed by the machine, so the initial blade position does not have to be precise.



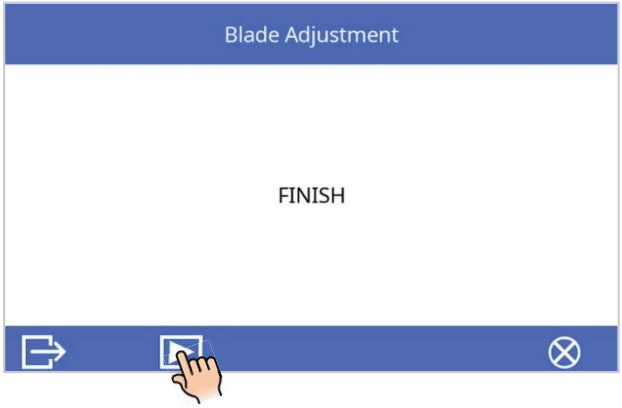
➢ *The movement may require a long time depending on the starting position of the cleaving blade.*

➢ *Make sure that the cleaving blade does not hit the fiber.*

6. *Press the SET key to start adjustment. The blade position will be adjusted automatically by the cleaver.*

➢ *The blade moves very slowly during adjustment.*

7. *After the fiber is cleaved, the clamps will release automatically. Remove the fiber and press the SET key to apply the adjusted position. To abandon the adjustment, press ESC key.*



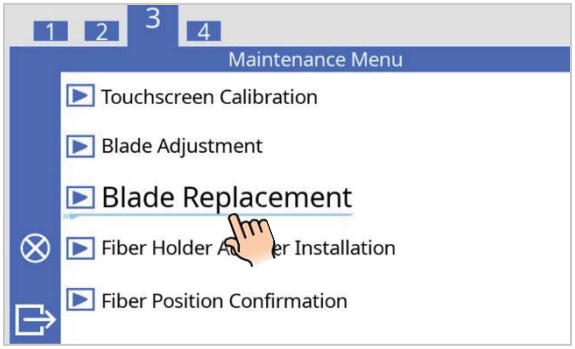
Blade Replacement

When all positions of the cleaver blade have been used, replace the cleaver blade by the following procedure:

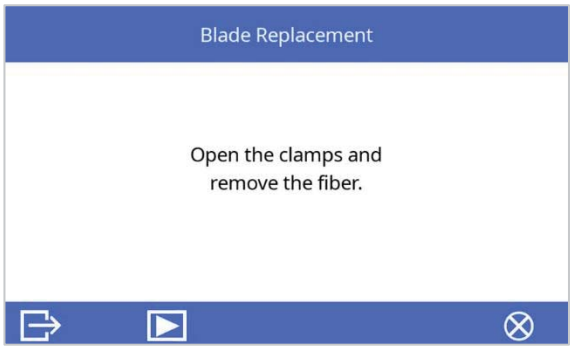
- *Be careful not to injure your hands or fingers with cleaver blade.*
- *Be careful not to drop anything into the machine.*
- *Do not use anything other than a (CB-06A) cleaver blade.*

Procedure

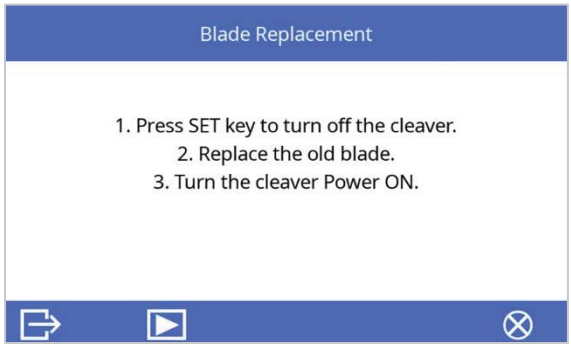
1. *Select [Blade Replacement] in [Maintenance Menu] and press the SET key.*



2. *When the following message is shown, confirm that a fiber is not loaded in the cleaver, then press the SET key.*

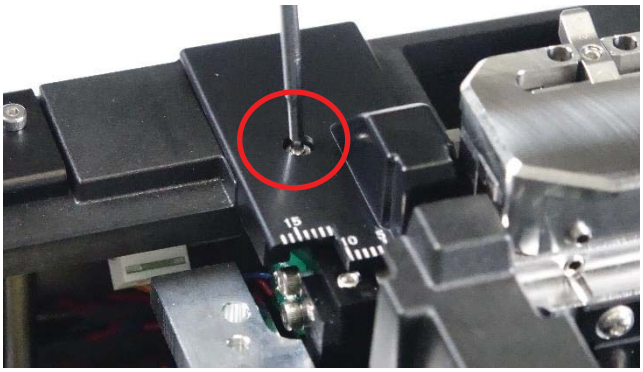


3. *When the following message is shown on the screen, press the ENT key to turn off the cleaver and confirm that the power LED turns off.*

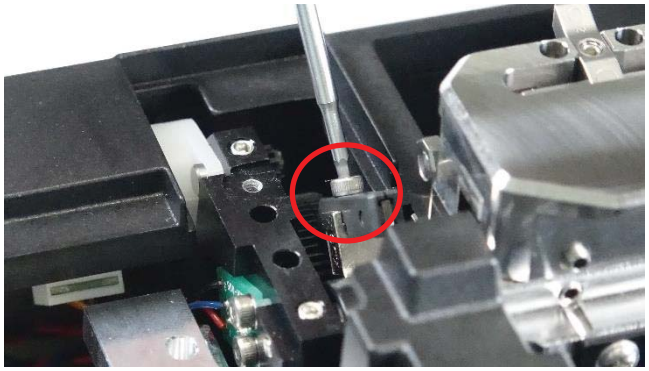


4. *Use the included 1.5mm hex wrench (HEX-01) to loosen the scale base screw and remove the scale base.*

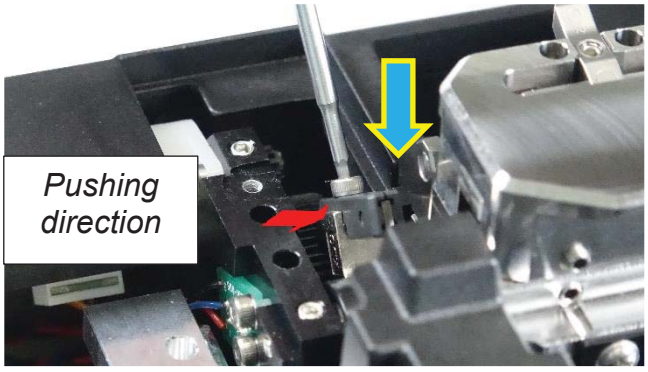
5. *Loosen the blade cover screw and remove the blade cover.*



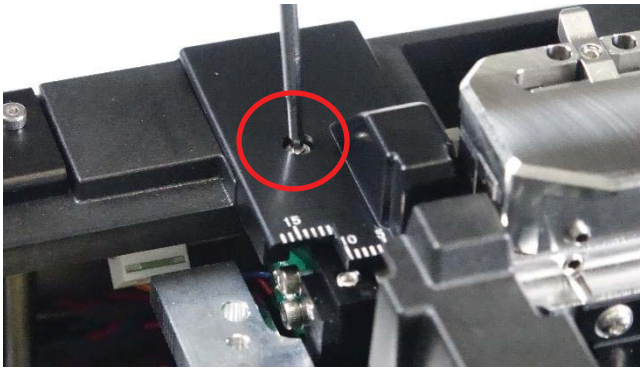
6. *Remove the cleaver blade.*



7. *Attach the new cleaver blade to the blade arm.*

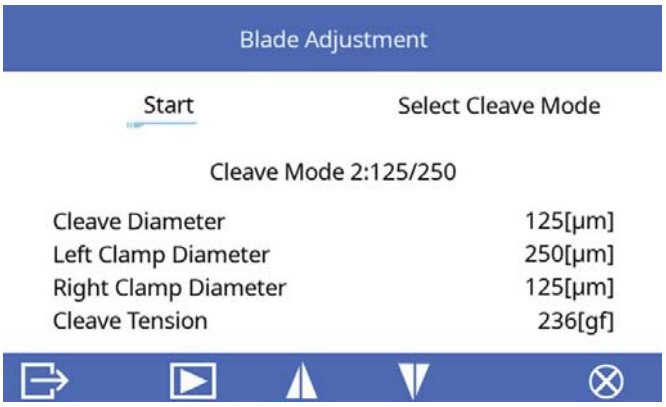


8. *Install the blade cover and tighten the blade cover screw.*



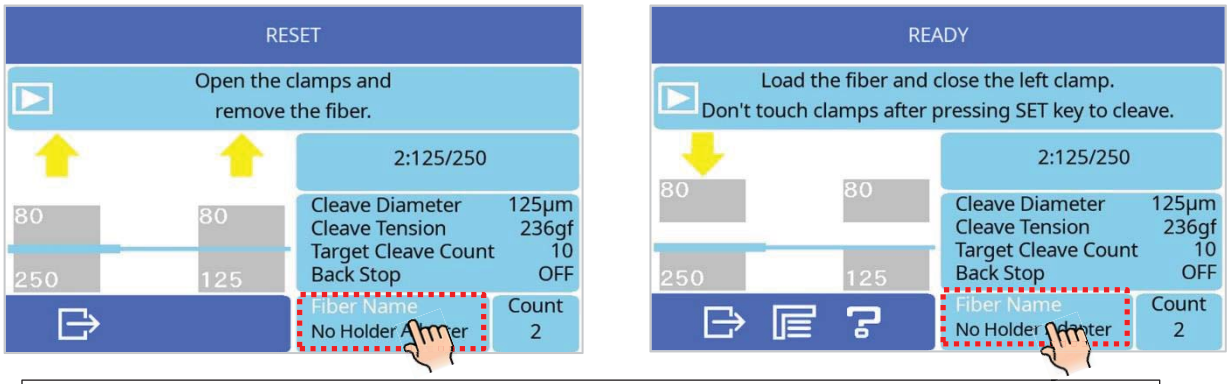
9. *Install the scale base and tighten the scale base screw.*

10. *Turn on the cleaver and the "Blade Adjustment" function will show up automatically. Perform a "Blade Adjustment" procedure. (Refer to "Blade Adjustment" for the process of adjusting the cleaver blade.)*



Fiber Holder Adapter Installation

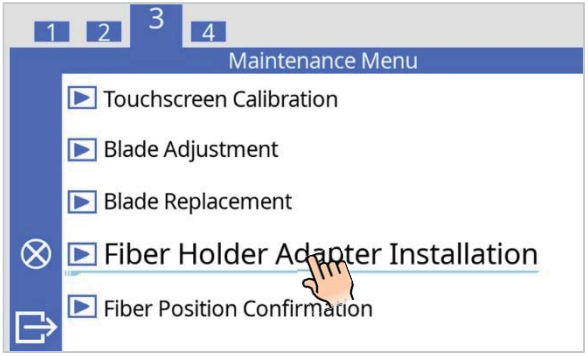
To attach the Fiber Holder Adapter, use the following process:

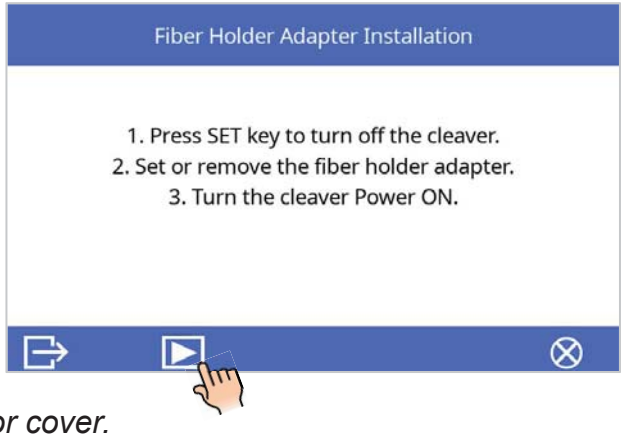


"Fiber Name" icon is a shortcut to the menu that holds the "Fiber Holder Adapter installation" function.

Procedure

1. *Press the DOWN key in the [Ready] or [Reset] state.*
2. *Select the [Fiber Holder Adapter Installation] function in [Maintenance Menu]. Press the SET key.*
3. *Unit will reset, then the Left clamp will retract.*





4. *Remove the scale base and the connector cover.*
5. *Install the Fiber Holder Adapter while the cleaver is powered off.*
6. *Turn the power ON. The left clamp will move forward and stop at the back of the fiber holder adapter.*

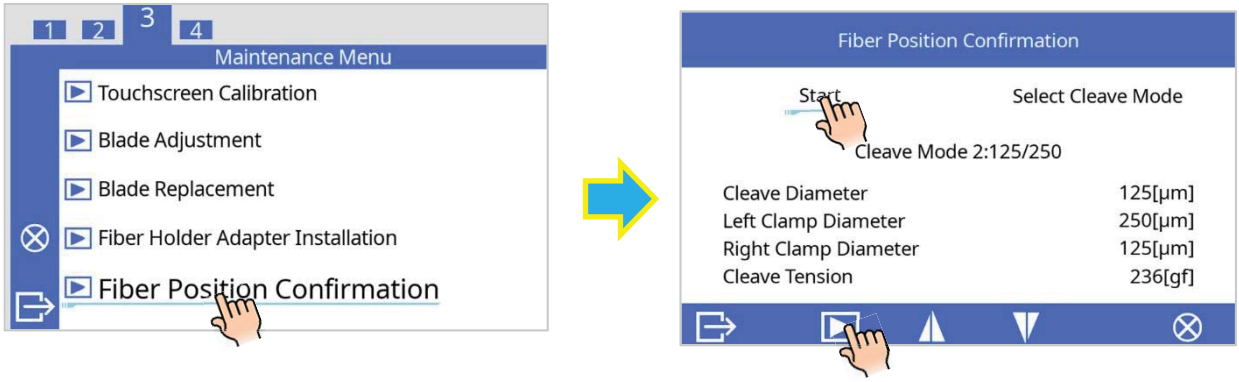
➢ *Be careful not to drop the screws or the Fiber Holder Adapter inside the device.*

When removing the Fiber Holder Adapter, reverse the above process.

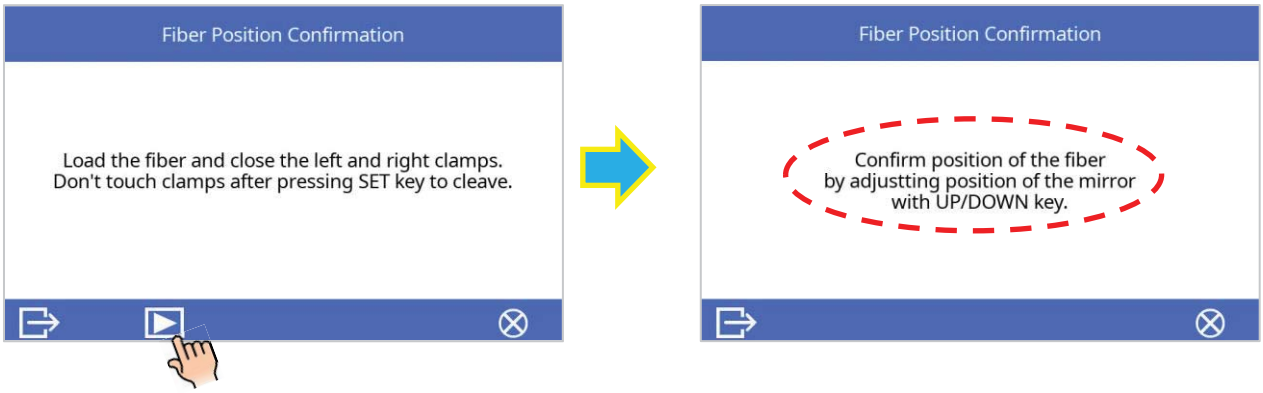
Fiber Position Confirmation

The fiber height of the left and right fibers can be confirmed with the Fiber Height Checking Mirror (CM-CT115).

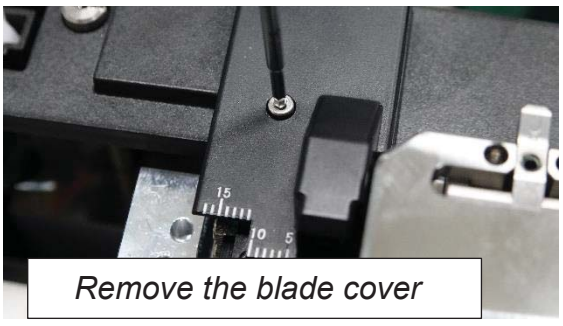
1. *Remove the scale base and select the [Fiber Position Confirmation] function in [Maintenance Menu], then press the SET key.*

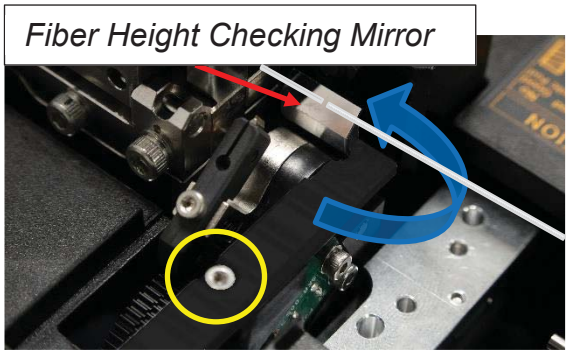


2. *Follow the on-screen instructions. A cleaving operation will start after a fiber is loaded. After cleaving, the screen will show the message circled below.*



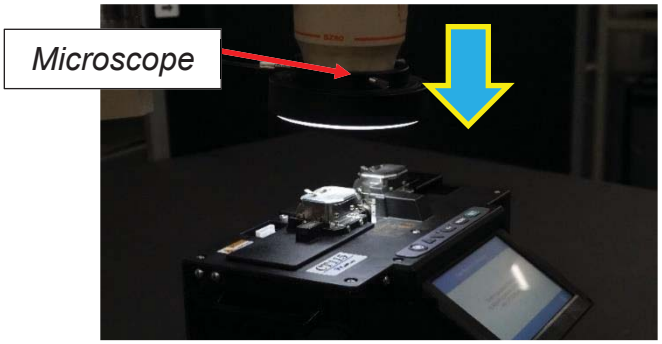
3. *Remove the blade cover, then attach the Fiber Height Checking Mirror in its place.*

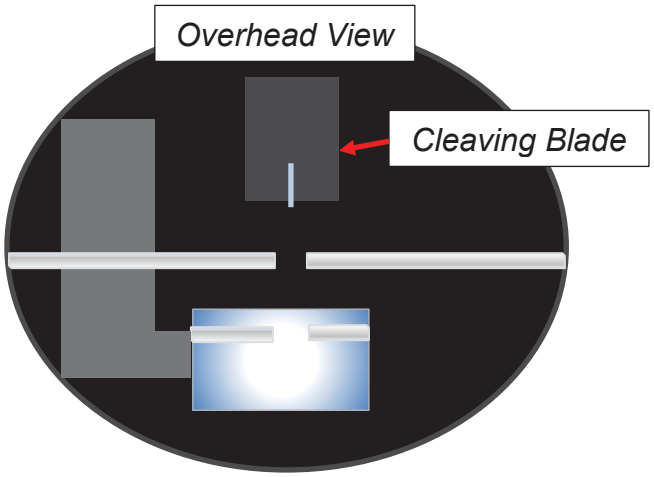




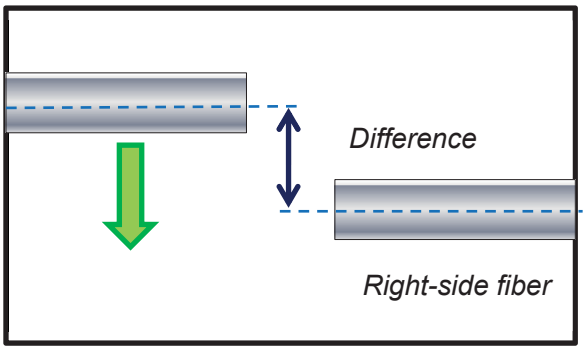
The mirror of the Fiber Height Checking Mirror should pass under the fiber, and be secured with the screw circled in yellow above.

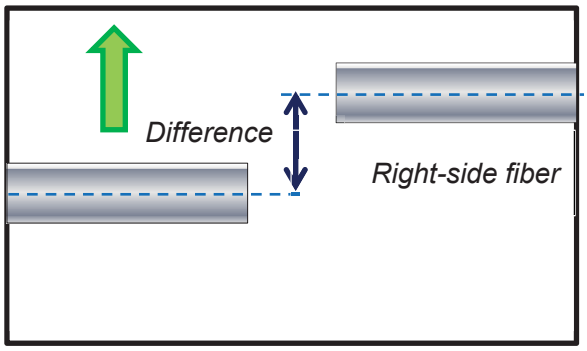
4. Position a microscope directly above the cleaver to use the Fiber Height Checking Mirror for inspection.





5. Inspect the fiber with a microscope. Inspect the difference between the centers of each fiber.



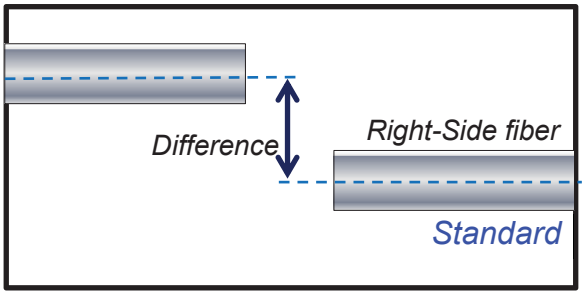


Guidelines for fiber height adjustment

**Height is adjusted using shims underneath the left insert base.*

- *Difference within 100μm……No adjustment needed*
- *Difference 110μm～200μm……..Increse or decrease the thickness of the shim on the left clamp to adjust*
- *Difference 210μm or more……Use a different size of insert.*

6. *Observe the fiber from directly above with a microscope. Check the difference between the centers of each side of the cleaved fiber*



Guidelines for lateral adjustment

- *Difference within 200μm……..No adjustment needed*
- *Difference 210μm or more……..Improper clamp position. May cause poor cleaving*

Diagnostic Test

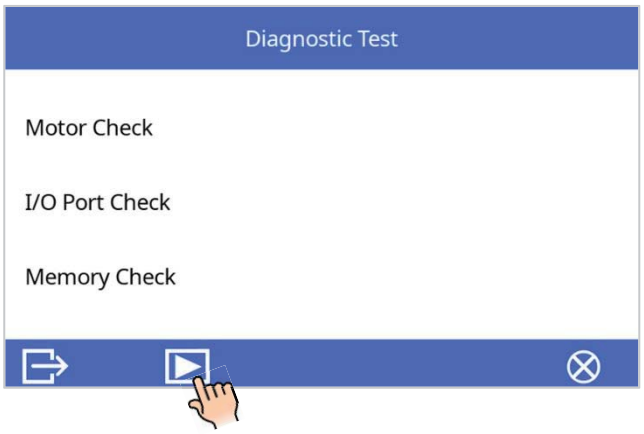
The cleaver has a built in diagnostic test function. This operates as a "check-up" and tests all the primary mechanized functions of the cleaver. When an issue arises with the cleaver's movement, run this function.

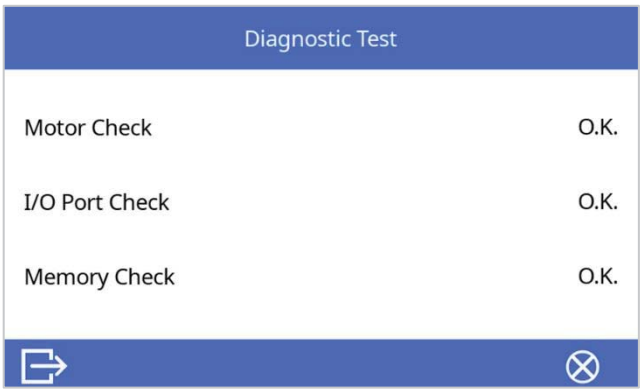
Check Item	Description
Motor Check	Checks the motors' movement.
I/O Port Check	Checks for normal operation of the input and output terminals of the internal circuitry.
Memory Check	Checks the memory of the internal circuitry.

Procedure

1. *Select [Diagnostic Test] in [Maintenance Menu] and press SET key.*

2. *When the [Diagnostic Test] screen is shown, press the ENT key to execute the check. The results will be shown after the check. Confirm that all results are "O.K." and press the ESC key to exit.*

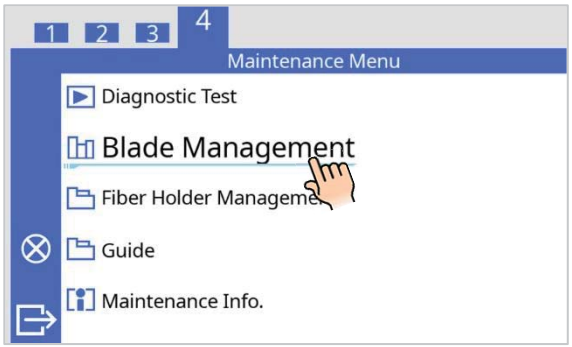




➢ *If the result is not "O.K.", contact the nearest distributor.*

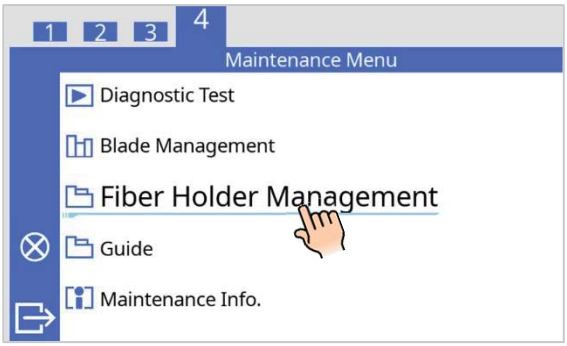
Blade Management

In the [Maintenance Menu], press the ENT key to go the [Blade Management] screen. Here, you can check the current blade position, change the blade position, and read the cleave count history for each blade position.

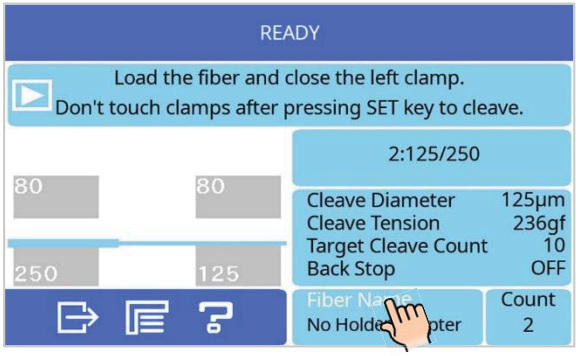


Fiber Holder Management

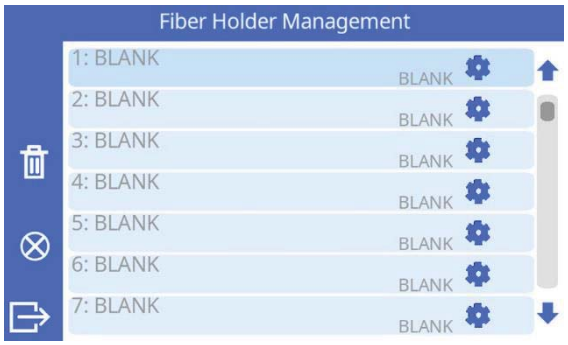
When using the FH110 fiber holders, you can link a cleave mode to the FH110 fiber holder being used. Press the ENT key to go the [Fiber Holder Management] in the [Maintenance Menu] or touch the icon as shown below.

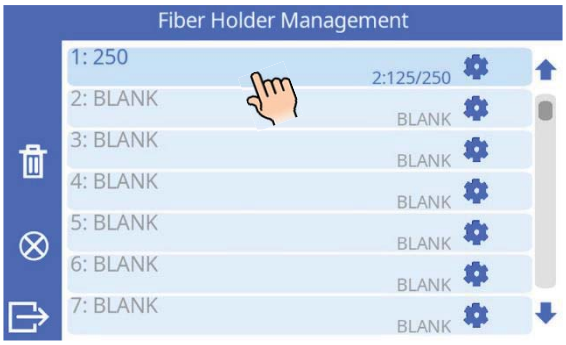


(OR)

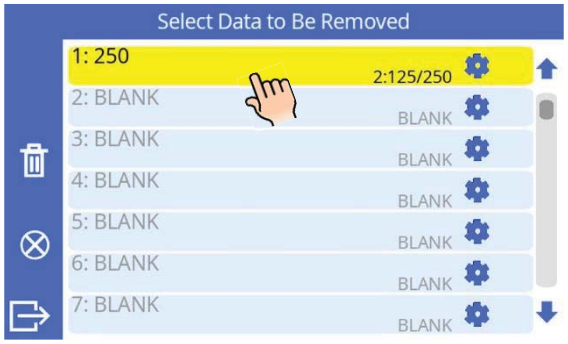


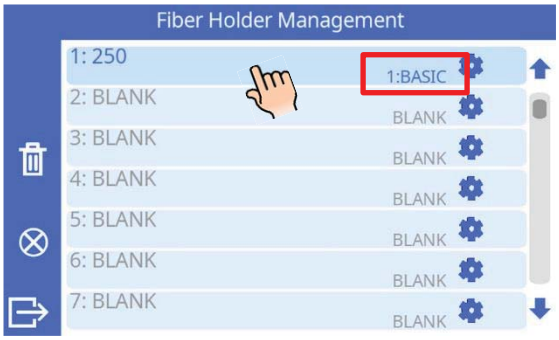
1. *Press the SET key to link the cleave mode to the FH110 while the FH110 is loaded. In the future, when you load that registerd FH110, the linked cleave mode will be automatically selected. You wlii be able to select from other available cleave modes for that fiber type.*





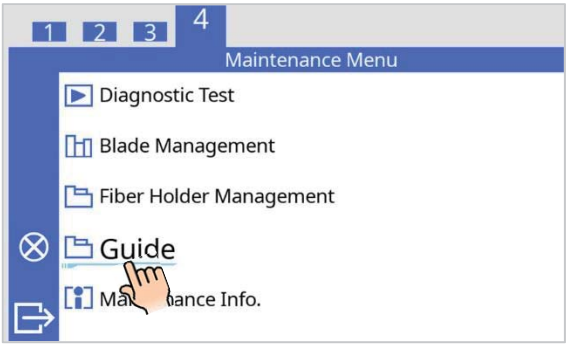
2. *The registered information can be deleted by pressing the Fn key and the SET key. The registered information can be edited by pressing only the SET key.*





User Guide

Select the [Guide] option in the [Maintenance Menu] to access the on-board instructions.



Maintenance Information

General information and maintenance information on this equipment can be found in the [Maintenance Information] menu.

Item	Description
Machine Type	Displays the Model of cleaver (eg. “CT116”
Serial Num.	Serial number of the cleaver.
Version	Current firmware version.
Blade Position	Cleave blade position, cleave count, blade life. Refer to “About Cleaver Counter” below for more information.
Cleave Count At Position	
Cleave Count Of Blade	
Cleave Count Of Machine	
Last Authorized Service	The date of last authorized service.
Next Authorized Service	The scheduled date of next authorized service.

About Cleaver Counter

The cleaver automatically keeps track of the number of cleaves on both the cleaver blade and the cleaver (machine) itself. The values are displayed as follows:

Blade Position:

Shows current blade position. The “Blade Position” can be changed to any position between position 1 and position 20. If “Blade Replacement” is performed, the blade position will be reset to position 1.

Cleave Count At Position

Shows cleave count at current blade position. If “Blade Replacement” is performed, this counter will reset to 0.

Cleave Count Of Blade

Shows overall cleave count of blade. If “Blade Replacement” is performed, this counter will reset to 0.

Cleave Count Of Machine

Shows Cleave Count of the machine. This counter cannot be reset.

Error Message List

Follow the solution as shown in the list below. If the listed solution does not eliminate the problem, the cleaver may require service by a qualified servicer. Consult an authorized distributor and provide the following information:

- *Model name*
- *Serial number*
- *Situation when the error occurs*

Error Message	Reason	Solution
Fiber Broken!	Unsuitable blade position	Execute [Blade Adjustment] from the [Maintenance Menu].
	Unsuitable backstop position	Adjust backstop position. *Refer to [Loading Fiber in Cleaver] section.
	Dust or dirt on the lower insert	Clean the clamp. *Refer to the [Daily Maintenance] and [Loading Fiber into the Cleaver] section.
	Clamp not closed properly	Confirm the release latch closes completely when clamps are closed.
Fiber Slip!	Dust or dirt on the clamp	Clean the clamp. *Refer to the [Daily Maintenance] and [Loading Fiber into the Cleaver] section.
	Clamp force too weak	Increase the [Left/Right Clamp Force].
	Improper insert installed	Select and install proper insert. Refer to [Insert selection guide].
Too High Tension!	“ Tension Fine Adjust” is set too low	Increase the value of [Tension Fine Adjust]
Too Far Blade!	Starting position of the cleaver blade is too far away from the fiber	Execute [Blade Adjustment].

Power Supply

(1) *Power does not turn on when pressing the ON/OFF key.*
Press and hold the power button until the LED color changes to green.

(2) *Power does not turn off when pressing ON/OFF key.*
・Pressing the button quickly will not turn off the cleaver. This is to prevent accidental shutdown.
Press and hold the power button until the LED color changes from green to red.

(3) *Machine times out and/or shuts down prematurely.*
・Refer to the [Machine Settings] section to change the power saving function parameters.

Cleave Operation

(1) *Error Message appears on monitor.*
・Refer to the [Error Message List].

(2) *Monitor suddenly turned off / No button response.*
・If the [Shut Down] function is enabled, the cleaver will turn the power off automatically after an extended period of inactivity. Press and hold the ON/OFF key until the LED color changes to green in order to turn the power back on.

(3) *Initialize cleaving parameters.*
・Refer to [Checking or editing Cleave Mode].

(4) *Unable to cleave.*
・Confirm that cleaver blade contacts the fiber during cleaving operation. If the blade does not contact the fiber, execute the [Blade Adjustment] function in the [Maintenance menu].
・There is a possibility that tension is to low. Confirm that the fiber tension is appropriate for the fiber diameter.
・Dust or dirt may be on the insert and/or cleaver blade. Refer to [Daily Maintenace] and [Loading Fiber into the Cleaver] section, and clean well.
・The cleaver blade may be worn out. Execute [Blade Position Change] in the [Maintenance Menu]. If all of the blade positions have been used, execute [Blade Replacement] in the [Maintenance Menu].

(5) *Cleave angle is too large / Cleave shape is not good*

- *Dust or dirt may be on the cleaver blade and insert. Refer to the [Daily Maintenace] and [Loading Fiber into the Cleaver] section and clean them.*
- *There is a possibility of improper [Cleave Tension]. Adjust the [Cleave Tension] by editing the [Tension Setting].*
- *The cleaver blade may be worn out. Execute [Blade Position Change] in the [Maintenance Menu]. If all of the blade positions have been used, execute [Blade Replacement] in the [Maintenance Menu].*
- *If the backstop is used, confirm that it is properly positioned. If the backstop is dusty or dirty, clean it. *Refer to the [Daily Maintenace] and [Loading Fiber into the Cleaver].*
- *Clamp force may be improper/insufficient. Adjust the [Left/Right Clamp Force] by editing the [Cleave Mode].*
- *The height of the lower insert may be improper. Adjust the height of the lower insert with reference to the [How to replace Insert and Shim] section.*
- *Setting [Left Clamp Position] larger may improve the cleave angle / cleave shape.*
- *Setting the [Clamp Mode] to "Left -> Right" may improve the cleave angle / cleave shape.*

Supervisor Settings

(1) *What functions can be disabled?*

- *See the [Menu Lock Settings] section.*

(2) *How to lock selection or editing of a Cleave mode*

- *See the [Menu Lock Settings] section.*

(3) *Forgot password*

- *Contact the authorized distributor.*

Other Functions

(1) *The screen is too dark.*

- *Press the DOWN key in the [READY] state to adjust the brightness.*

Certificate

The optical fiber cleaver (CT115/116) uses RFID technology. Typical certification or regulations are below.

United States FCC

FCC ID: 2A9PZ-CT11X
Contains FCC ID: QOQ-BGM220S2

FCC CAUTION
Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment and meets the FCC radio frequency (RF) Exposure Guidelines. This equipment should be installed and operated keeping the radiator at least 20cm or more away from person's body.

Canada ISED

IC: 29835-CT11X
Contains IC: 5123A-BGM220S2

This device contains licence-exempt transmitter(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada's licence-exempt RSS(s). Operation is subject to the following two conditions: *1. This device may not cause interference.* *2. This device must accept any interference, including interference that may cause undesired operation of the device.* *This equipment complies with ISED radiation exposure limits set forth for an uncontrolled environment and meets RSS-102 of the ISED radio frequency (RF) Exposure rules. This equipment should be installed and operated keeping the radiator at least 20cm or more away from person's body.*
L'émetteur/récepteur exempt de licence contenu dans le présent appareil est conforme aux CNR d'Innovation, Sciences et Développement économique Canada applicables aux appareils radio exempts de licence. L'exploitation. est autorisée aux deux conditions suivantes : *1. L'appareil ne doit pas produire de brouillage;* *2. L'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.* *Cet équipment est conforme aux limites d' exposition aux rayonnements énoncées pour un environnement non contrôlé et respecte les règles d' exposition aux fréquences radioélectriques (RF) CNR-102 de l' ISDE. Cet équipment doit être installé et utilisé en gardant une distance de 20 cm ou plus entre le tadiateur et le corps humain.*

※Access to the information on the e-Label
The device is electronically labeled and the FCC ID/IC Number can be displayed via the "Maintenance Info." under the Settings menu.
Step1 : Select "Menu" button
Step2 : Select "Maintenance Info."
Step3 : Push the down button to display "Certificate"

Warranty

Warranty period and limits

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

1. *Trouble or damage due to natural disaster.*
2. *Trouble or damage due to mishandling.*
3. *Trouble or damage due to handling in disregard of the operating procedures or instructions described in the instruction manual.*
4. *Consumable items (cleaving blade etc.)*

Please note that memory contents such as cleave results may be lost depending on the kind of repair.

Necessary information needed for repair

Include all documentation with the cleaver, and inform us of the details 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 cleaver.*
3. *Problems encountered*
   a. *What problems does your cleaver exhibit and when?*
   b. *What is its present operational state?*
   c. *The state of the monitor and the contents of the relevant error message etc.*

Transporting the cleaver

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

Before shipping the cleaver

Please consult the authorized distributor before shippng.

Contact Address

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

Fujikura Europe Ltd.
C51 Barwell Business Park
Leatherhead Road, Chessington, Surrey KT9 2NY, UK

General inquiries: +44-20-8240-2000
Service & support: +44-20-8240-2020
URL https://www.fujikura.co.uk

AFL
110 Hidden Lake Circle,
Duncan, SC, 29334, U.S.A.
P.O.Box 3127 Spartanburg, SC 29304-3127

URL https://www.aflglobal.com
General inquiries, Service & support: +1-800-235-3423, Opt. 2

Fujikura Asia Ltd.
438A Alexandra Road, Block A Alexandra Techno Park #08-03, SINGAPORE, 119967

General inquiries, service & support: +65-6-278-8955
URL https://www.fujikura.com.sg

Fujikura Ltd.
1-5-1 Kiba, Koto-ku, Tokyo 135-8512, Japan

General inquiries: +81-3-5606-1164
Service & support: +81-43-484-3962
URL https://www.fujikura.com

Fujikura (CHINA) Co., Ltd.
7thFloor, Shanghai Hang Seng Bank Tower, 1000 Lujiazui Ring Road, Pudong New Area, Shanghai 200120, CHINA

General inquiries, Service & support: +86-21-6841-3636
URL http://www.fujikura.com.cn

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