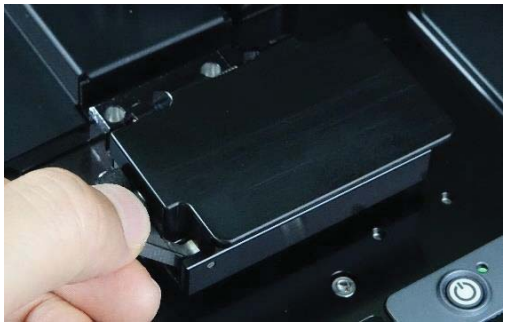
Proof Test operation (FSR116)

Open Flat Clamps

Lower the lever to open both the right and left clamp lids.



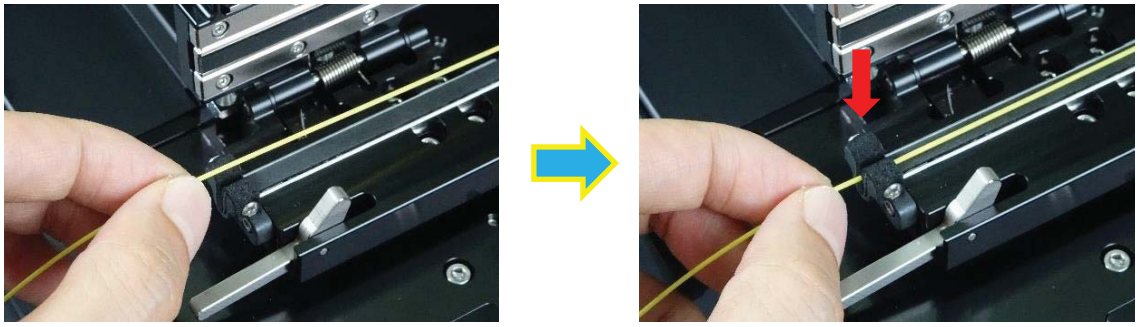
Clamp Pads for Flat Clamp

If there is dust or dirt on the fiber coating or the rubber pads on the clamps, the flat clamps are not able to hold and may slip the optical fibers. Make sure to check and clean the fiber and the rubber pads with alcohol before use.
If the fiber slips during the operation, clean the fiber and the rubber pads as well.

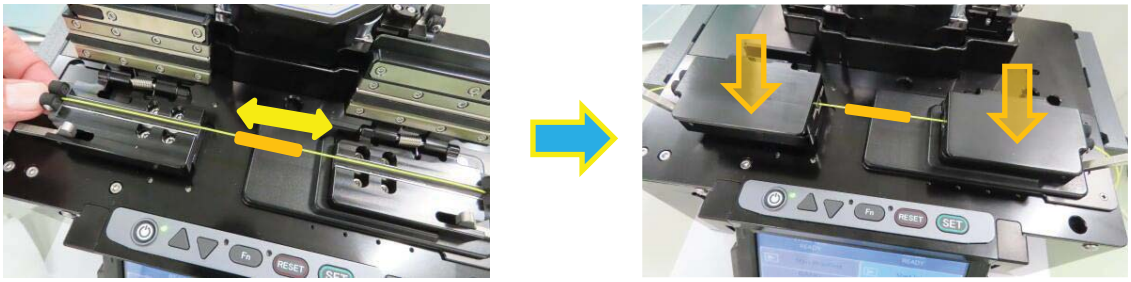
- *Clean with an alcohol-impregnated cotton swab or lint-free tissue or gauze.*
- *Use the alcohol of 99% or more of purity.*

Setting fiber in the Flat Clamps

1. *Place a fiber on the rubber pads, then set the fiber on the Fiber Guides and fix it on both sides.*



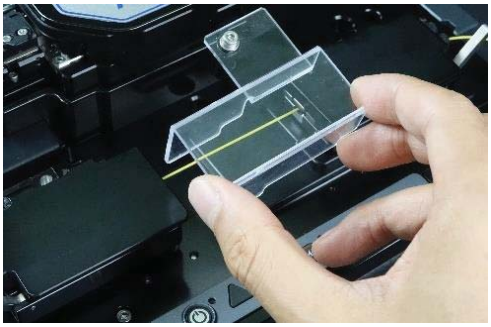
2. *Align the recoated part of the fiber with the center of the left and right clamps and close the left and right clamp lids. Make sure the clamp lid is tightly closed.*
   The Clamp lid may not completely close if the fiber coating diameter is too large, so close the lid by pushing it down.



- *Confirm the recoated part is in the center of both the left and right and clamps.*
- *Confirm both the left and right fibers are not twisted.*
- *Confirm the fiber is not loosened.*

Fiber Protection Cover

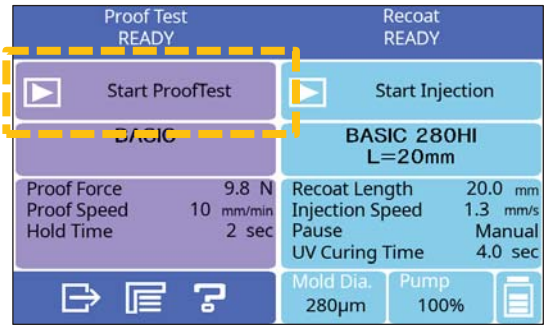
Prepare the Fiber Protection Cover [PC-03]. Usually, proof test cannot be started if this is not installed on the Recoater.



Fiber Protection Cover for FSR116

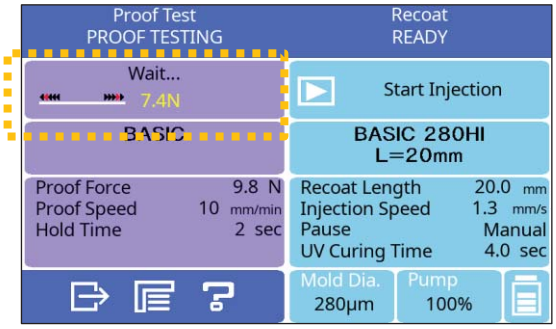
Excecute the Proof Test Operation

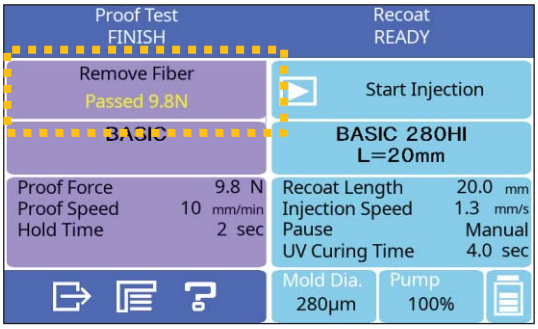
1. *After loading a fiber in the Clamps, attach the Fiber Protection Cover on the Recoater. Touch the [Start ProofTest] on the screen.*



- *The proof test movement can be stopped by pressing Fn key" twice" during the proof test.*

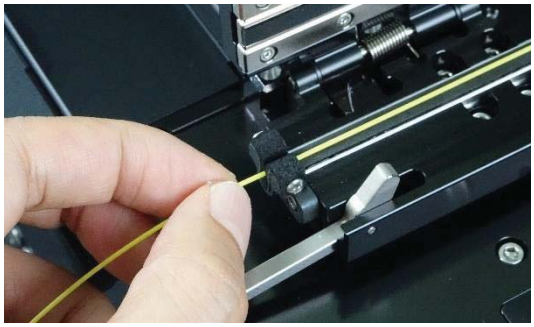
2. *After the proof force reaches the set force and hold time, the buzzer sounds to inform completion of the proof test. If the proof force does not reach to the set force, the buzzer sounds also.*

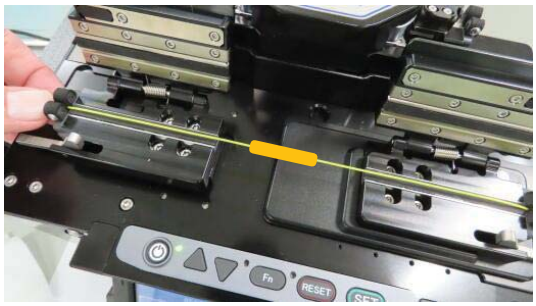




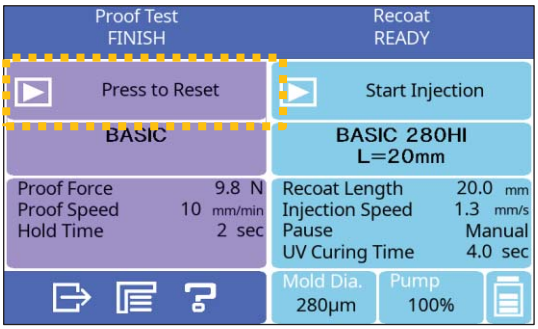
➢ *Do not remove the Fiber Protection Cover during proof testing.*

3. *Remove the Fiber Protection Cover and open the Clamps. Lift up the fiber from the Fiber Guides.*





4. *Touch [Press to Reset] icon or press Fn key. The right clamp moves to the original position automatically.*



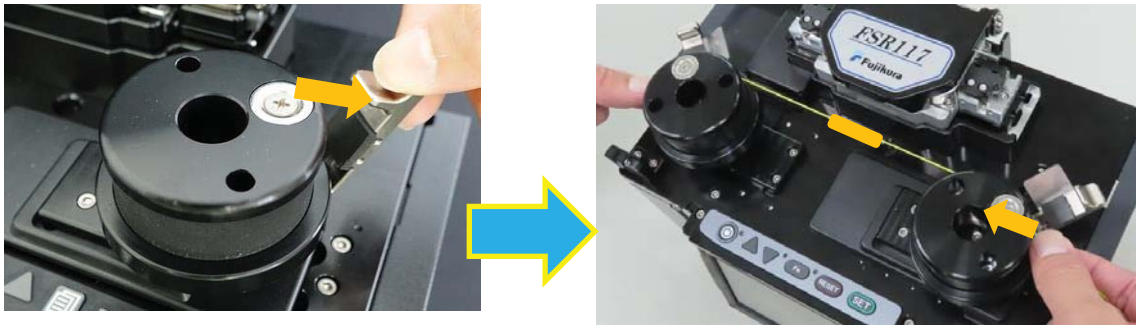
➢ *Settings in all "BASIC" Modes are same. Change the settings according to operation.*

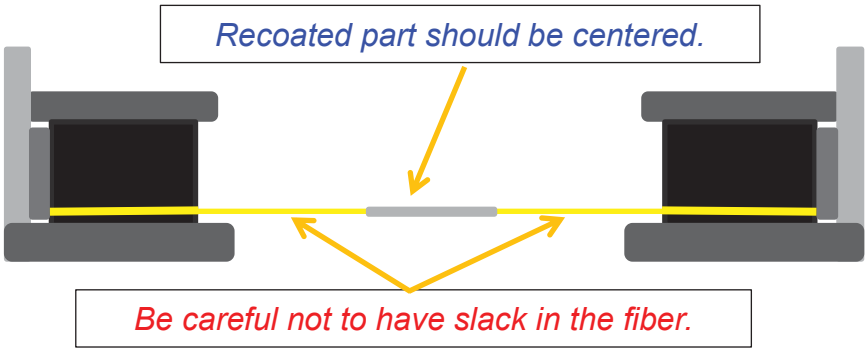
➢ *Proof Force may not reach the force set depending on the fiber coating or the fiber diameter.*

Proof Test operation (FSR117)

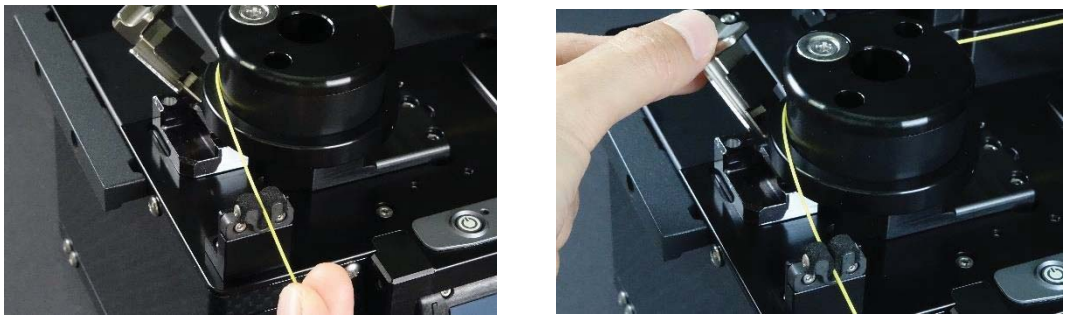
Procedure of Proof test (Mandrel type)

1. *Open both sides of Levers and load a fiber so that the recoated part is centered between both Clamps. When loading the fiber, position the fiber on lower side of the Clamp.*



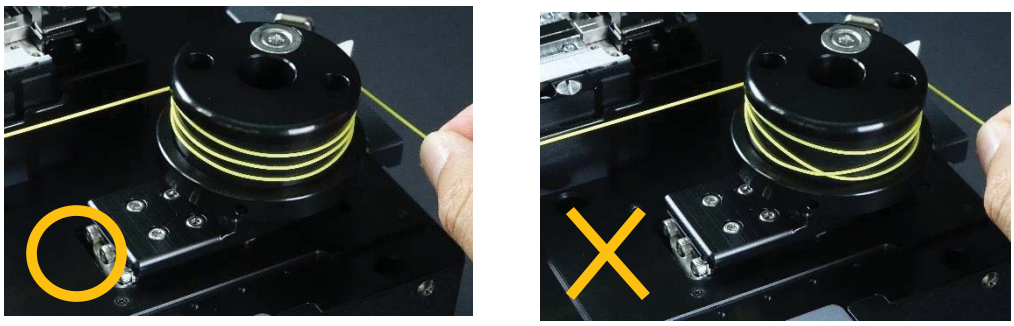


2. *Guide the left fiber to the Fiber Fixture and close the left Clamp.*

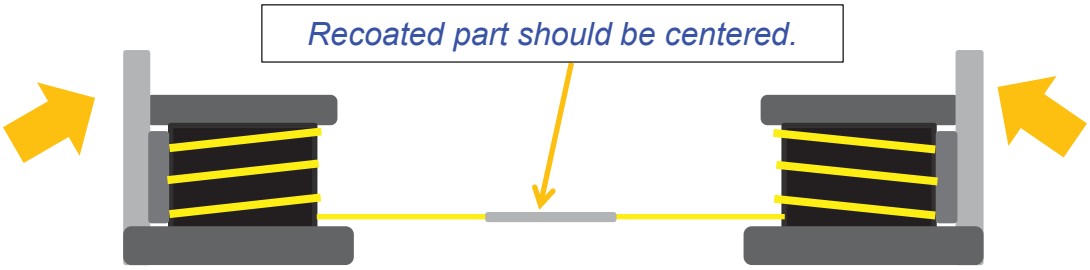


- *When loading, position the fiber on lower side of the Mandrel Clamps.*
- *Be careful not to have slack in the fiber.*
- *Load the fiber so that the recoated part is centered between both Clamps.*

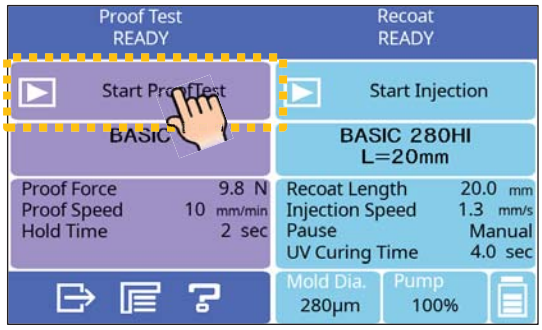
3. *Wind the fiber on the right Clamp with no overlap, and then close the right Lever.*



4. *Wind the fiber on the left Clamp in the same way, and close the left Lever.*

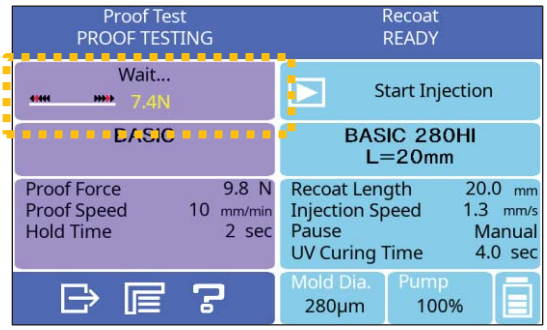


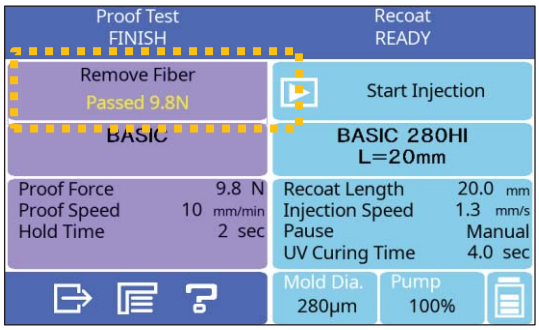
5. *Attach the Fiber Protection Cover and press Fn key or touch [Start ProofTest] icon to start Proof Test.*



➢ *The proof test movement can be stopped by pressing Fn key" twice" during the proof test.*

6. *After the proof force reaches the set force and hold time, the buzzer sounds to inform completion of the proof test. In case the proof force does not reach to the set force, the buzzer sounds and error message is displayed.*

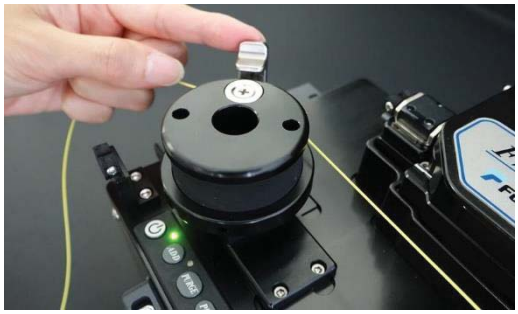




➢ *Do not remove the Fiber Protection Cover during proof testing.*

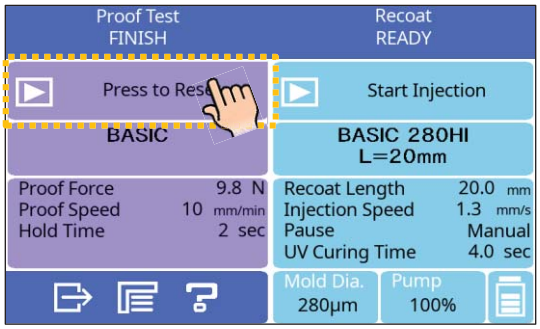
7. *Remove the Fiber Protection Cover and open the left Clamp. Hold the fiber and remove it from the Fiber Fixture. And then wind off the fiber from the left Mandrel.*

8. *Close the left Lever not to have slack in the fiber. Hold the fiber and open the right Lever. And then wind off the fiber from the right Mandrel.*



9. *Open the left Lever and remove the fiber.*

10. *Touch [Press to Reset] icon or press* Fn *key. The right clamp moves to the original position automatically.*

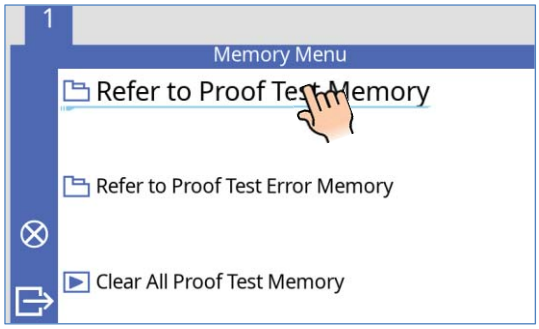


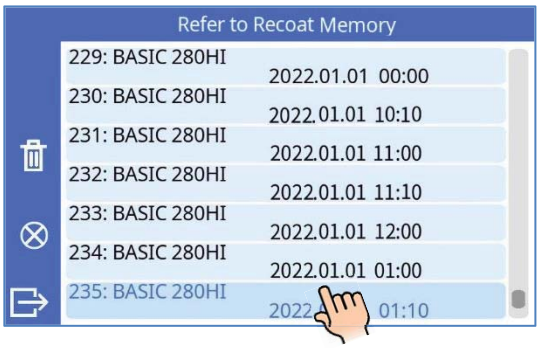
11. *The result of the proof test is saved in the memory.*

Memory of proof test results

This Recoater stores up to 5,000 proof test results and can be checked.

> *After the 5,000th result is stored, 5,001st proof test result is written over 1st result, and the old proof test results will be deleted from the storage.*





Pre-operation Cleaning and Checking

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

Cleaning of the Recoat Mold

Be sure to wipe off the UV curable material off the Recoat Mold after recoating.

Clean the Recoat Molds with alcohol-impregnated lint-free tissue or gauze. Do not use any liquid other than alcohol. Otherwise, it may cause deterioraton or breakage of this product.
To clean the groove, move an alcohol-impregnated cotton swab in the direction along the groove only. Do not scrape the groove forcefully. Otherwaise, it may cause breakage of the Recoat Mold. Insufficient cleaning may cause irregular recoating formations or insufficient injection amount.

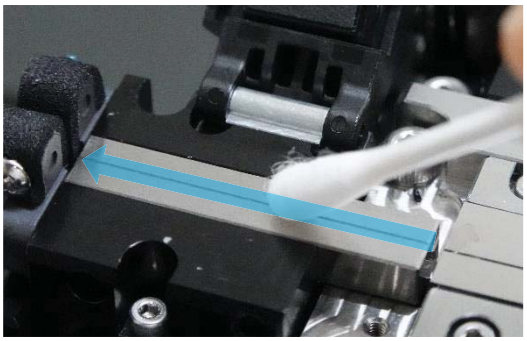
Cleaning of the Glass mold

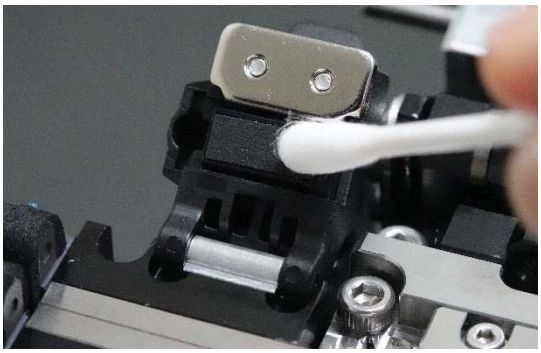
Cleaning of the U groove

- *After injecting UV curable material, be sure to clean the Glass Mold like above photos.*
- *After recoat operation, be sure to clean both the upper and lower Glass Molds.*
- *Use the alcohol of 99% or more of purity.*

Cleaning of the Fiber Height Adjuster

Clean the rubber pads on the Fiber Height Adjuster or Sheath clamp, otherwise the optical fiber cannot be held and slippage may occur.Please check and clean before operation. Do not use any liquid other than alcohol.





- *Clean the upper and lower rubber pads by moving an alcohol-impregnated cotton swab in one direction only.*
- *Use the alcohol of 99% or more of purity.*

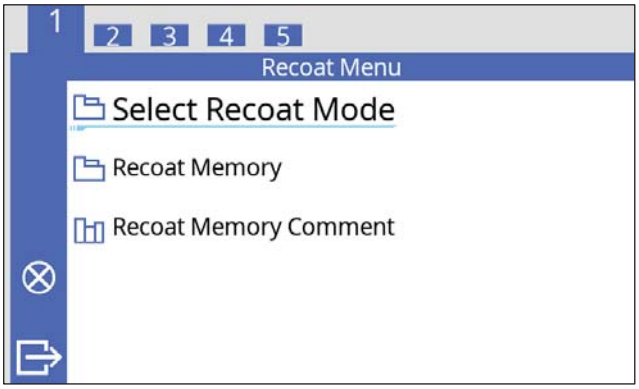
Cleaning Clamp Pads (FSR116)

Clamp pads hold the fiber. If clamp pads are dirty, the fiber may slip. Clean both the right and left clamp pads before proof test operation.
Use alcohol for cleaning.

- *Clean the upper and lower rubber pads by moving an alcohol-impregnated cotton swab in one direction only.*
- *Use the alcohol of 99% or more of purity.*

Composition of Recoat Menu

Enable to edit recoat mode and check the recoat result saved in the memory.



Item	Description
Select Recoat Mode	*Recoat Mode can be selected according to fibers. Recoat Mode Parameter can be edited and set.*
Recoat Memory	*Past recoat results and the parameters can be checked. *[Special settings] and [UV only] cannot be saved.*
Recoat Memory Comment	*The recoat result is automatically stored in memory. Once a commented is entered, the same comment is used for subsequent recoat results. At the time of shipment from factory, there is no comment inputted.*

Selecting Recoat Mode

It is necessary to setup the optimal recoating parameter for a particular UV material and select the suitable recoat mode. The main parameters stored in each mode are as follows.

- *Resin Injection Quantity*
  Recoat length [mm] or Recoat Volume [ul]
  The unit of the Resin injection Quantity can be changed in the [Indication Settings] of the [Machine Settings] in the [Setting Menu].
- *Resin Injection Speed[mm/s] [ul/s]*
- *Quntity Adjsut Ratio*
- *Add Quantity[%]*
- *UV Curing Time[sec]*
- *UV Lamp Power*

How to set the parameters of Recoat Mode

- *Recoat length [mm]*
  Change the value when you want to control recoating length.
- *Resin Injection Quantity [ul]*
  Change the value when you want to control the quantity of the UV curable material.
- *Add Quantity*
  The quantity of additional injection of the UV curable material can be set.
- *UV Curing Time*
  Change the value depending on the type of the coating material of the recoated fiber or the refractive index of the UV curable material.
- *UV Lamp Power*
  The power of the UV Lamp can be set.

Selecting Recoat Mode

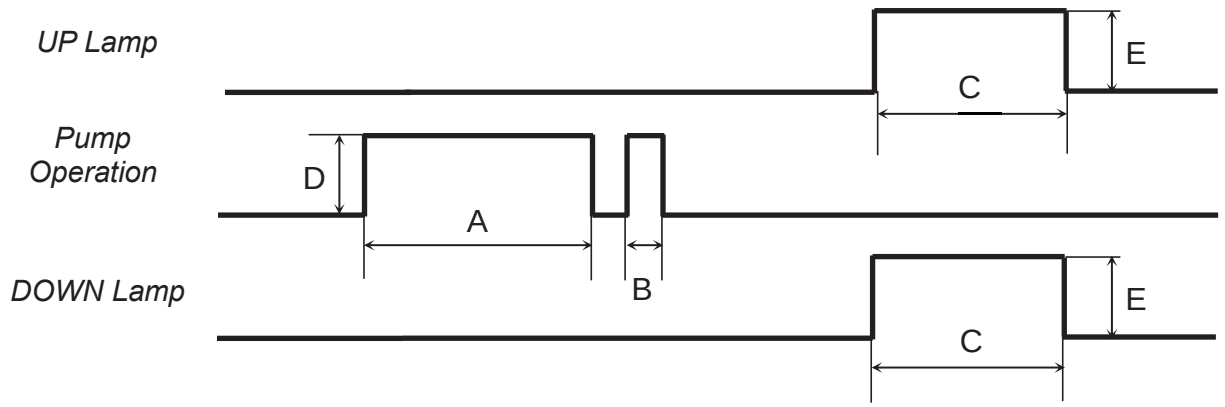
There are 4 modes for recoat mode as follows.
** [****] in the table below indicates the mold diameter.*

Name of Mode	Description
*BASIC **** HI*	*This mode is for high refractive index material.* *Optimal recoating for high refractive index material can be achieved by changing UV Lamp On time or UV Lamp Power in this mode.*
*BASIC **** LI*	*This mode is for low refractive index material. Default of the UV Lamp On time is 10 seconds.* *Optimal recoating for low refractive index material can be achieved by changing UV Lamp On time or UV Lamp Power in this mode.*
*SPECIAL *******	*This mode is to enable to change the injection quantity, speed, UV lamp power and time individually to stabilize the recoat shape.* *Set [Special Setting] on the 2nd page of the BASIC mode can set the same way.*
UV Only	*Enable to set the UV lamp only; use this mode when the manual recoat operation is executed.*

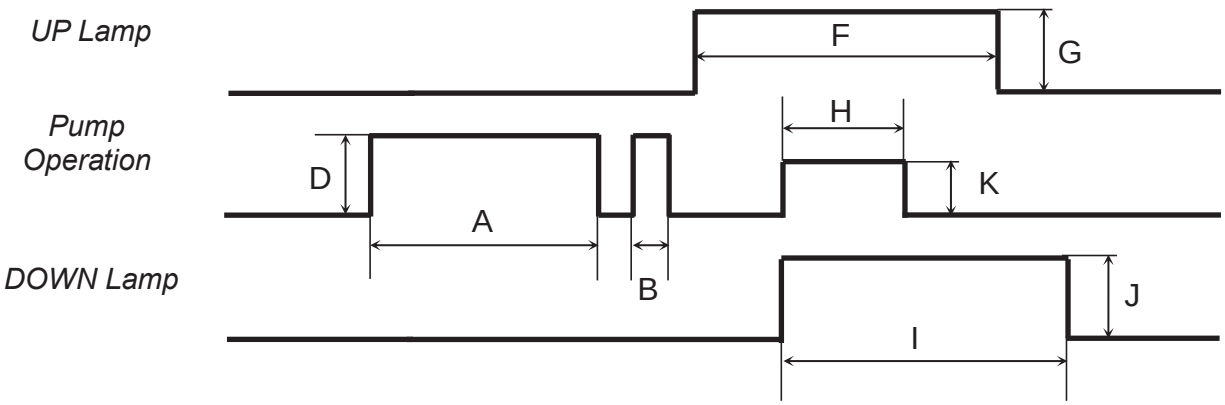
In according to the difference of the refractive index and the condition of curing, there are Hi and LI modes in BASIC mode in advance.
In these two modes, the initial settings of the UV curing time and the UV lamp power are different.
In both modes, the UV curing time and the UV lamp power need to change the parameter accordingly.

The movement outlines of BASIC mode and SPECIAL modes are as following.

≪BASIC≫ Mode



≪SPECIAL≫ Mode



*Total operation time of SPECIAL mode takes longer time than BASIC mode.

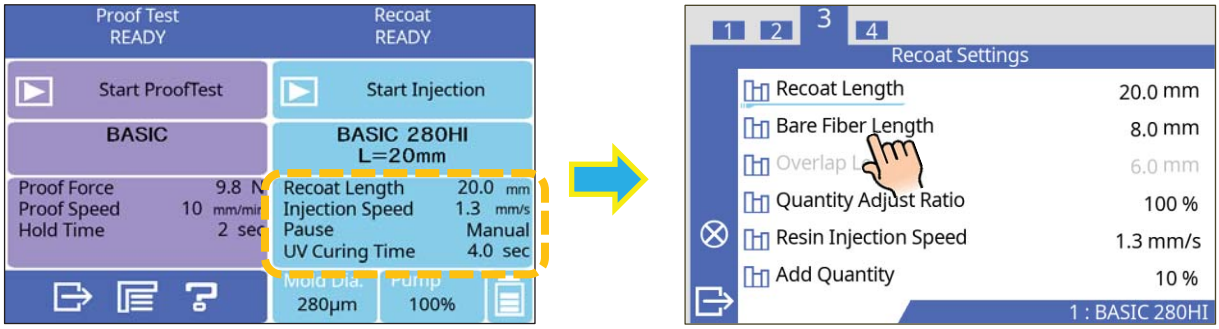
A: Resin Injection Quantity	B: Add Quantity	C: UV Lamp On Time
D: Resin Injection Rate	E: UV Lamp Power	F: UP Lamp On Time
G: UP Lamp Power	H: Re-Resin Injection Quantity	I: DOWN Lamp On Time
J: DOWN Lamp Power	K: Re-Resin Injection Rate	

Checking or editing Recoat Mode

Recoating parameters in each Recoat Mode can be modified. To edit parameters follow the steps below:

Check the edited mode

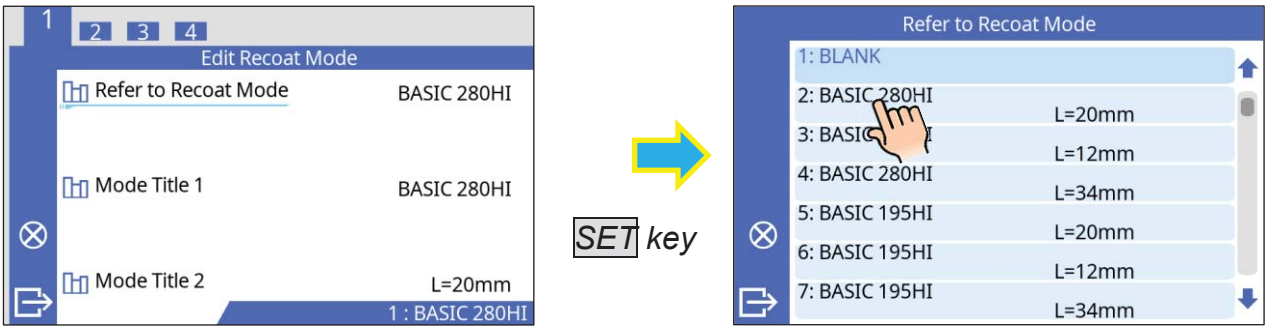
1. *Touch the part of the current mode in [Ready] screen.*
2. *Select the parameter which you wish to edit in [Recoat Settings].*
3. *Change the amount.*
4. *Touch icon to return to [Ready] screen.*



Initialization of the edited parameter

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

1. *Touch the part of the current mode in [Ready] screen.*
2. *Select [Recoat Settings] in [Edit Recoat Mode].*
3. *Select the Recoat Mode you wish to edit in the list.*
4. *Press SET key after the message shows up.*
5. *The parameter starts to be initialized.*
6. *After editing, touch icon to return to [READY] screen.*

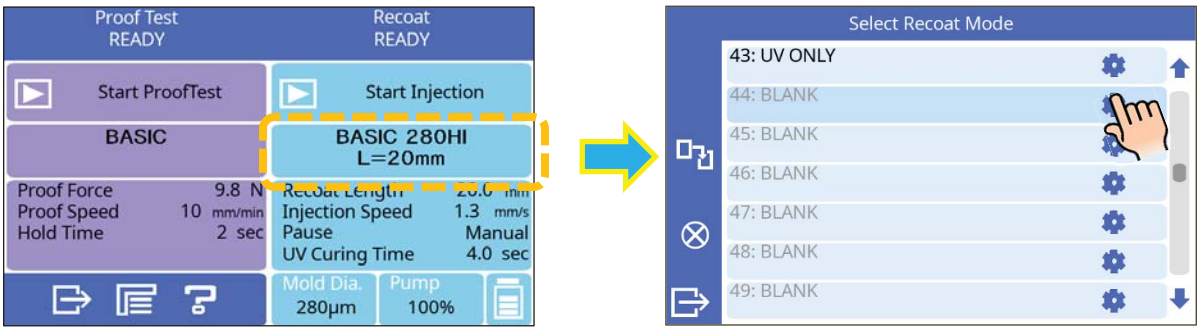


Creating or erasing recoat mode

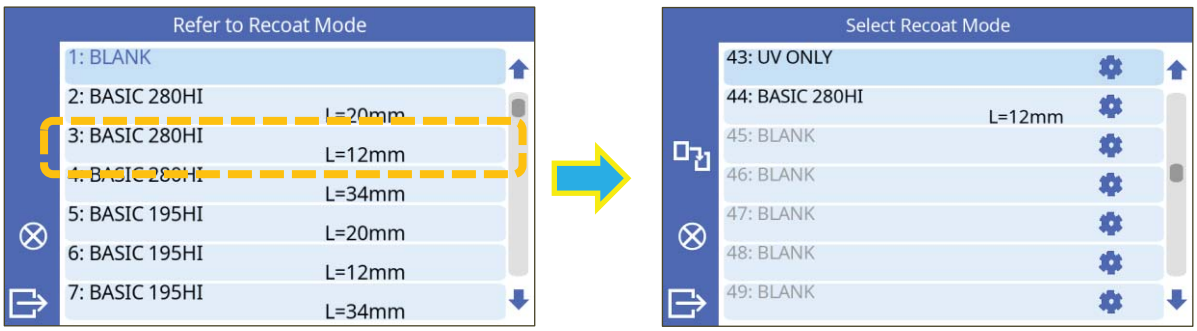
How to create recoat mode

Standard recoat modes are stored when the Recoater is delivered, and all the other modes are displayed as [BLANK]. Follow the procedures below to add a new mode. The Recoat mode can create up to 100 modes.

1. *Touch the Recoat mode part in [Ready] screen. The [Select Recoat Mode] shows up.*
2. *Touch icon of "BLANK" line in [Select Recoat Mode] screen.*



3. *A message shows up and press SET key or touch icon.*
4. *A new mode is displayed in the line you selected.*



How to delete a recoat mode

Recoat mode can be deleted. The "BLANK" is displayed in the line after you deleted the recoat mode.

1. *Select the recoat mode you wish to delete and touch icon to enter [Select Recoat Mode].*
2. *Select "BLANK".*
3. *A message shows up and press SET key or touch icon.*
4. *The recoat mode is deleted and "BLANK" is displayed instead.*

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

Parameter of Recoat Mode

BASIC mode

There are 4 pages in the BASIC mode. The parameters are as follows.
Parameter of the BASIC mode

Parameter	Description
Fundamental settings	
Refer to Recoat Mode	List of recoat modes stored in database is displayed. A selected recoat mode stored in the database area is copied to a selected recoat mode in the user-programmable area.
Mode Title 1	Title for a recoat mode expressed in up to 11 characters.
Mode Title 2	Title for a recoat mode expressed in up to 11 characters. Title 2 is displayed under the Title 1 at the [READY] screen.
Mold Diameter	Displays the diameter of the Recoat Mold that is used.
Fiber Diameter	Enter the cladding diameter of recoat to be used. The cladding diameter of the optical fiber value needs to be changed when the optical fiber that has the different diameter to be recoated.
Cladding Diameter	Enter the cladding diameter of the fiber.
Special settings	Enable to turn ON/OFF the Special Settings. The initial setting is OFF. Set ON changes the display of the 3rd page and operates the same moves as the special mode. Refer to [Special Settings] for details.
Recoat settings	
Recoat Length[mm] Recoat Volume[ul]	Set the injection quantity of the UV curable material.
Bare Fiber Length[mm]	Enter the stripped length of the fiber coating. This length is used for calculation of the injection quantity.
Overlap length	This value is caliculated from recoat length and bare fiber length.
Quantity Adjust Ratio	Calibration value of the increase/decrease amount of the injection quantity affected by the temperate or humid. If the correction value was used, the recoating time may become longer.
Resin Injection Speed[mm] Resin Injection Speed[ul]	Set the speed of the injection. *Too high speed may cause bubbles in a recoated area.
Add Quantity	Set the additional injection amount of the UV curable material after injection. Or, set the additional injection amount of the UV curable material when pressing Up key or icon. * The setting value is the amount when [Resin injection amount] is set to100%.
Pause (After Injection)	Set wait time of the start of the UV lamp turn on after injecting the material. When "Manual" is selected, press SET key to turn on the UV lamp. It is recommended to select “Manual” to confirm the injection of the material.
UV curing time	Set the on time of the UV lamp.
UV lamp Power	Set the power of the UV lamp. If the UV lamp power is set to high, the curing time will be faster but the shape may become unstable.

UV curable material Injection Quantity

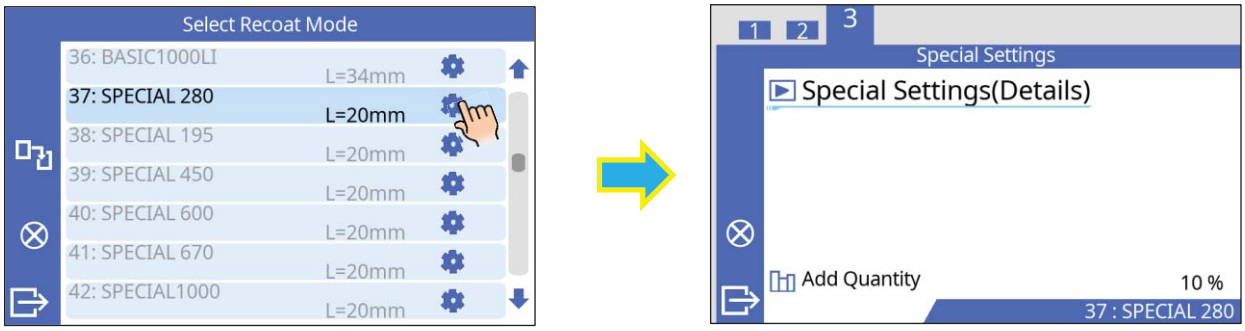
This recoater can change the injection quantity of UV curable material by [mm] or [ul] and adjust accordingly. However, the overlap amount is buried by the cleaning condition or the fiber coating diameter.
When conducting the recoat operation, please make sure to check the injection quantity is enough by observing from the top, as the cover is opened.
Also enter the appropriate injection quantity if the filling amount is insufficient each time.

It is not easy to overlap when the difference between fiber coating dia. and Mold dia. Is small.

It is easy to overlap when the difference between fiber coating dia. and Mold dia. is large.

Special Mode Settings

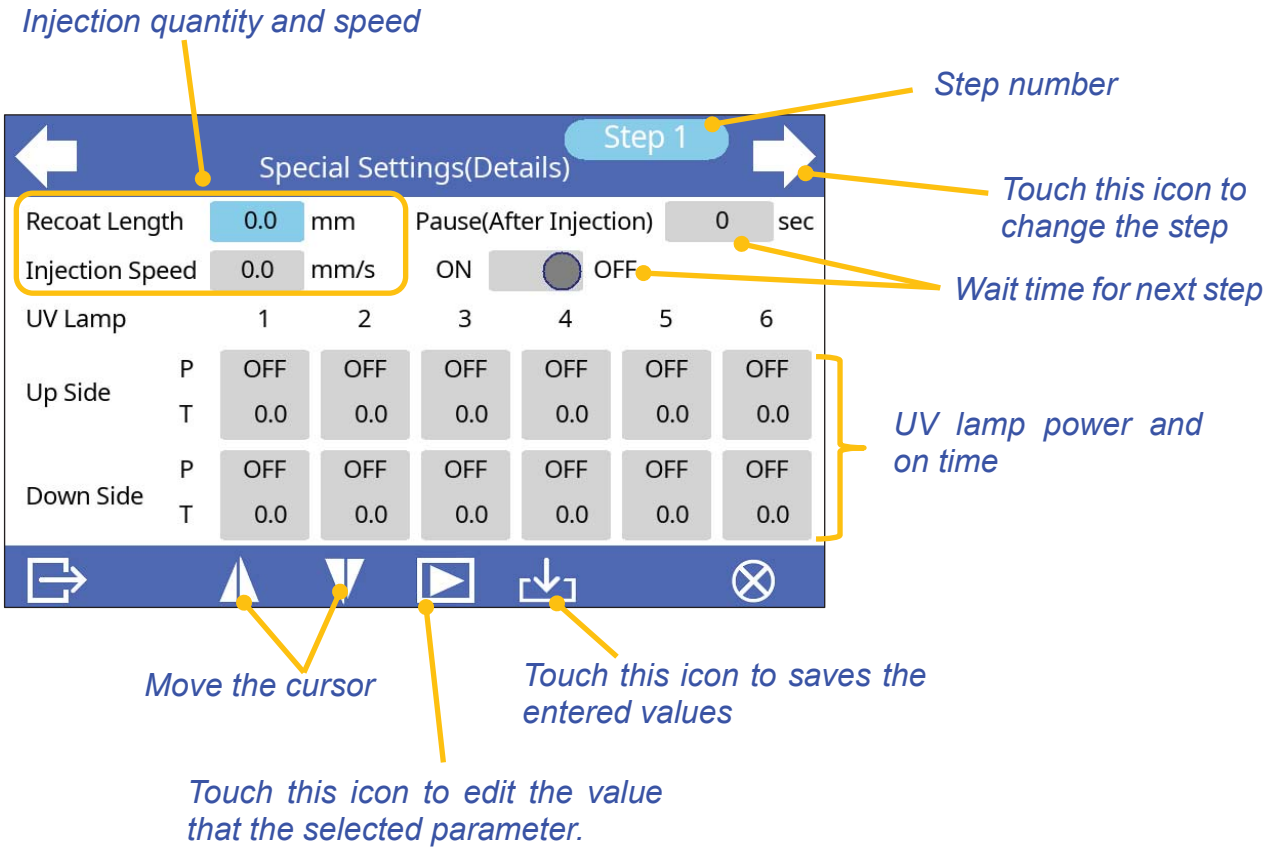
In SPECIAL mode you can set the injection quantity and rate or the specific UV lamp settings.



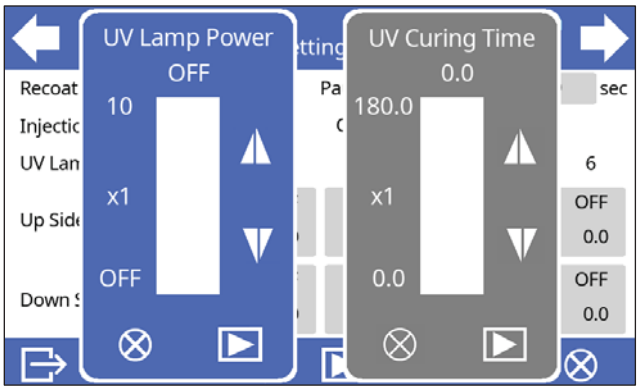
Parameter	Description
Fundamental settings	
The structure of the menu is the same as BASIC mode. Please refer to the BASIC mode for details.	
Special settings	
Special settings (Details)	・Each operation of the UV curable material or UV lamp etc. is individually controlled from step 1 up to step 10. ・Control the irradiating position of the UV lamp individually, or control the on sequencing of the UV lamps or to inject the material in a step-by-step manner. Special Settings (Details) is on next page.
Add Quantity	Set the additional injection amount of the UV curable material after injection. Or, set the additional injection amount of the UV curable material when pressing Up key or icon. * The setting value is the amount when [Resin injection amount] is set to100%.

The parameter of Special settings (Details)

Set the parameters at each step and conduct the continuous operation, while adjusting the settings to suit the user.
Tocuh icon to save all the settings after adjusting the settings at every STEP.



Touch each lamp on the screen, and then display the input secreen for UV lamp power and time as below screen. The blue frame is editable. The editable parameter can be changed by touching each frame.

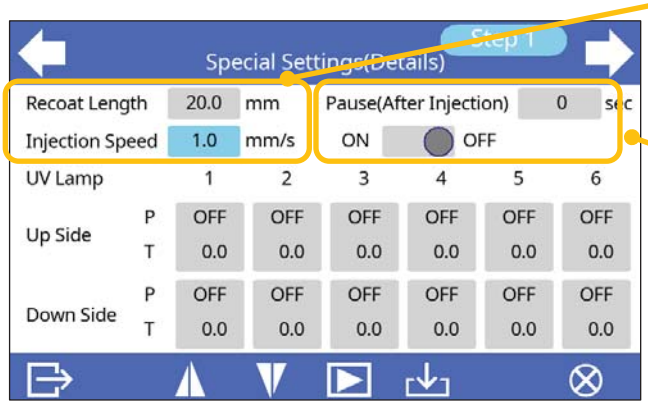


- *Injecting UV curable material and turning on UV lamp can be performed at the same time.*
- *UV lamp power can be set from 1 to 10 or OFF.*

Movement of Special Settings

It is possible to control various parameters by using Special Settings.

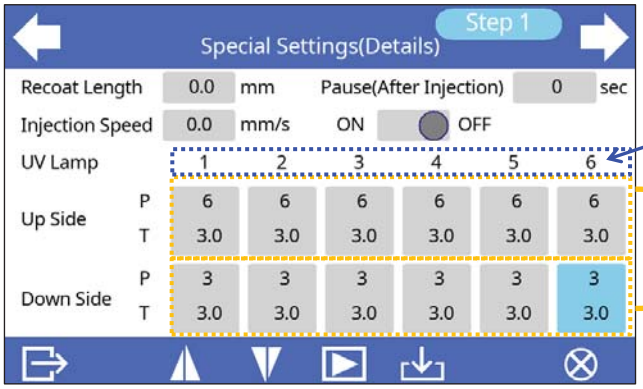
Injection settings



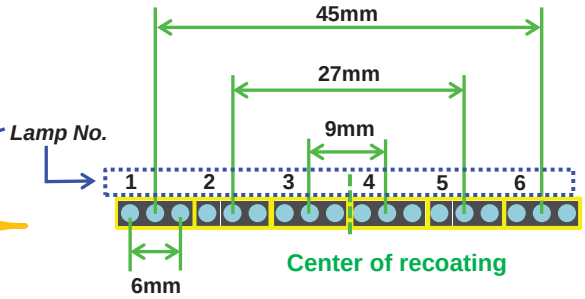
Enter the injection settings in this area.

Change to [MANUAL] when operators want to check the injection amount after injecting.

Settings of power and time of UV Lamps



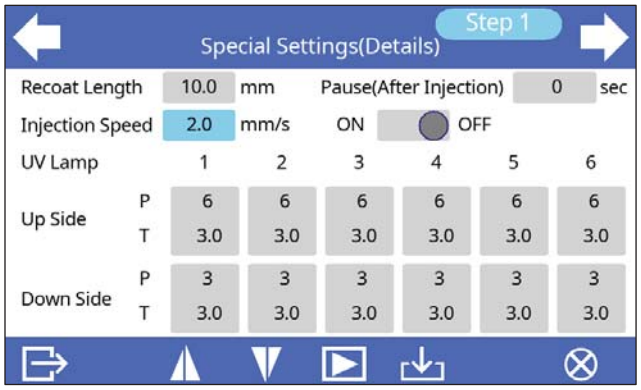
Position of UV Lamps



Lighting position of each UV Lamp

In above settings, power of all upper UV Lamps are [6] and on-time of all upper UV Lamps are [3.0] seconds.
It is possible to set different power from UV Lamp No.1 to UV Lamp No.6.
No.1 is the left UV Lamp most and No.6 is right UV Lamp most.

An example of Special settings



Injection and UV curing can be moved at the same time by entering both parameters.

In above settings, UV Lamps are lighted during injecting UV curable material.

Memory of recoat results

This Recoater stores up to 5,000 recoat results. Contents of data stored are different depending on the recoat mode. The recoat mold used and the number of times what that mold have been used are also stored. The parameters of [Special settings] cannot be memorized.

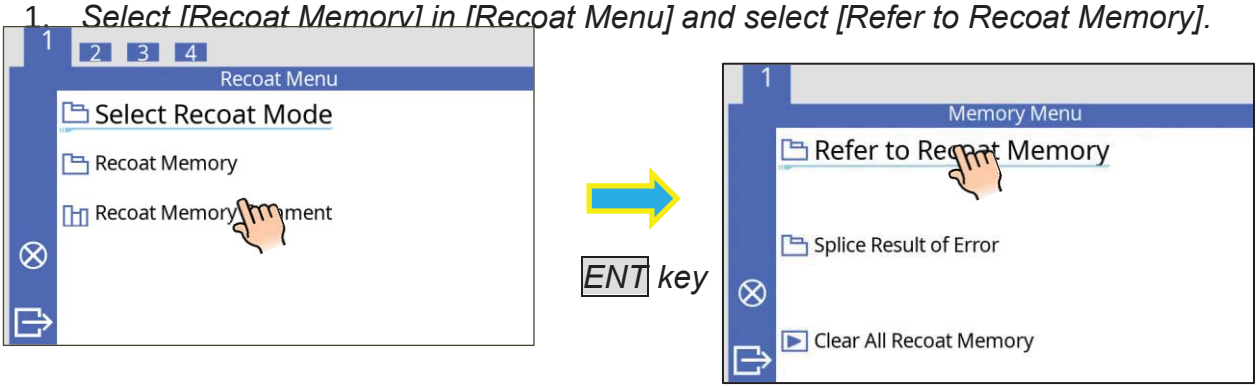
Reference or elimination of recoat results

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

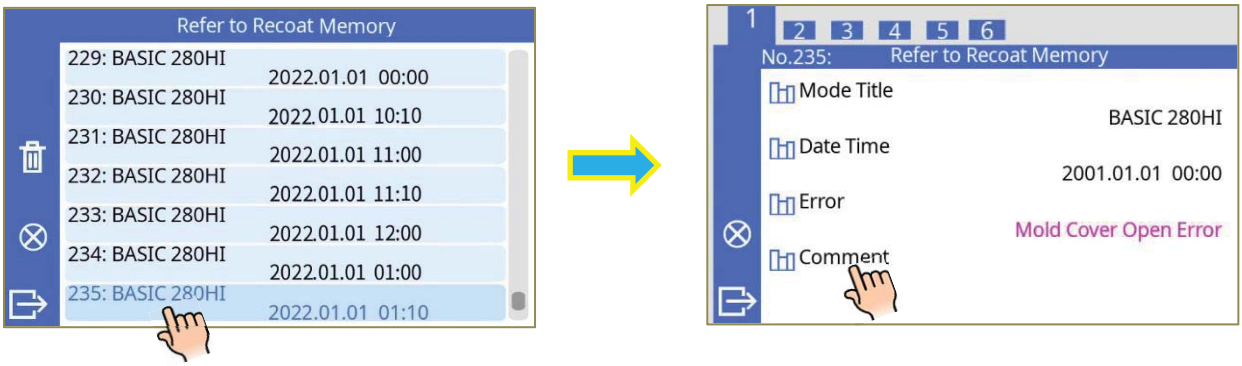
> ➢ *Memory data can be downloaded by USB. Refer to instruction manual of "Data Connection".*

How to display the recoat result data

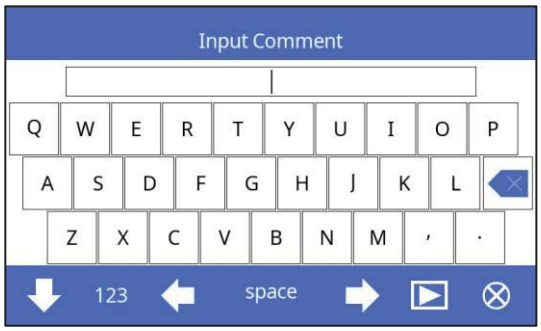
1. *Select [Recoat Memory] in [Recoat Menu] and select [Refer to Recoat Memory].*



2. *The list of recoat results is displayed. Select the memory you wish to check.*
3. *The memory you have chosen is displayed.*

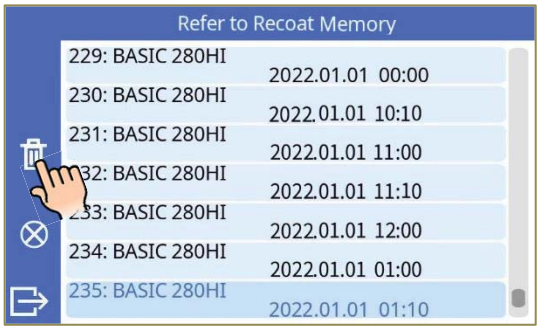


4. *Touching the screen or pressing the SET key to enter the keyboard screen for editing the comment.*



How to delete the recoat result data

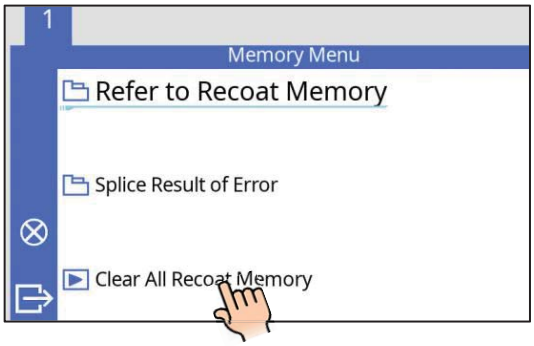
1. *Select the memory you wish to delete in [Refer to Recoat Memory].*
2. *Touch* *icon in the left.*
3. *A confirmation message shows up. Select "OK".*
4. *The memory you selected will be deleted.*



Clear all recoat result data

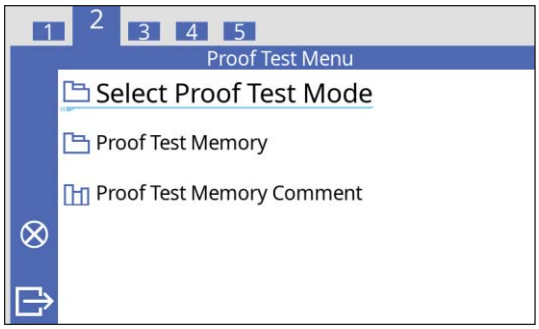
All recoat results can be cleared at once.

1. *Select [Clear All Recoat Memory] in [Memory Menu].*
2. *A confirmation message shows up. Touch* *icon to clear all recoat memories.*



Composition of Proof Test

Parameters of Proof Test Mode and machine setting can be set.



Item	Description
Select Proof Test Mode	*Mode for proof testing. The parameters in all modes are same values when it is delivered.*
Proof Test Memory	*Past proof test results and the parameters can be checked.*
Proof TestRecoat Memory Comment	*The recoat result is automatically stored in memory. Once a commented is entered, the same comment is used for subsequent recoat results. At the time of shipment from factory, there is no comment inputted.*

Parameters of Proof Test Mode

Proof Test Mode consists of the parameters listed below.

- *Proof Force*
- *Proof Speed*
- *Hold Time*

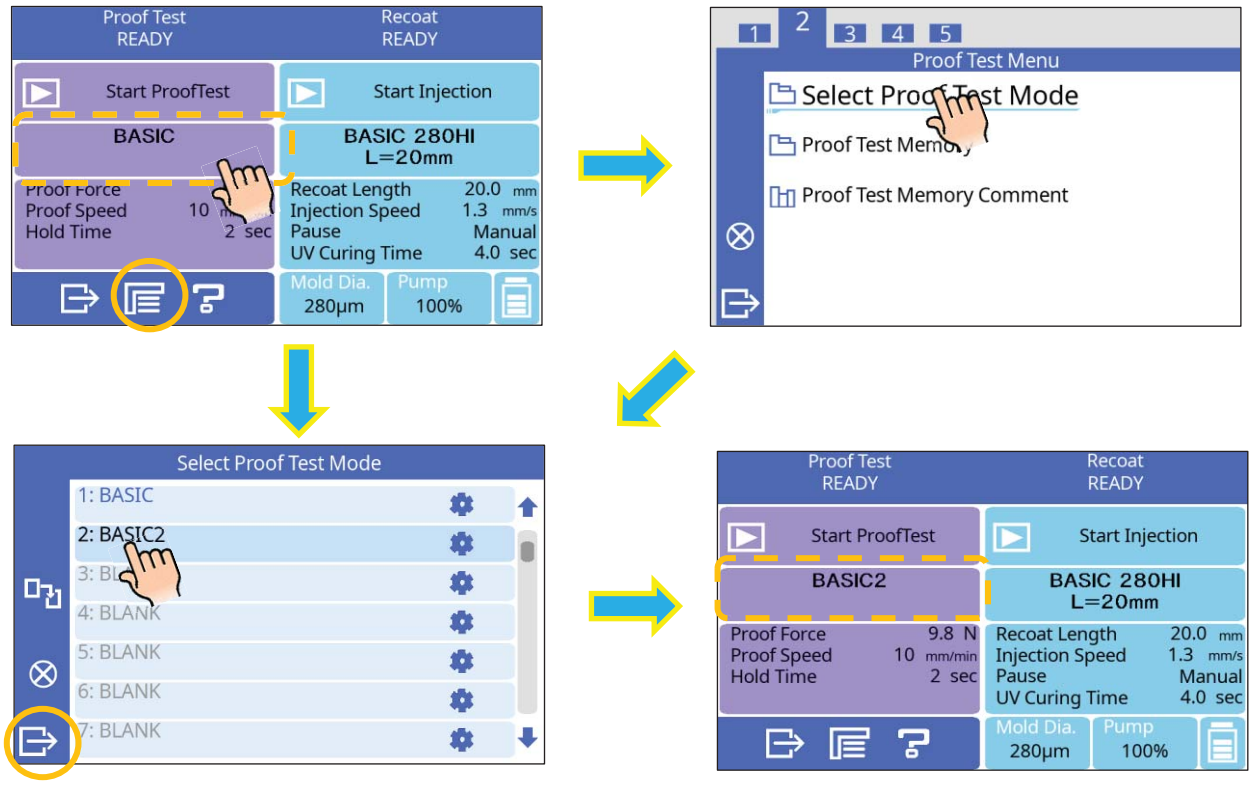
How to set the parameters of Proof Test Mode

- *Select the unit for proof test form [kgf], [N], or [ksi].*
  The unit for proof test can be changed in in [Indication Settings] in [Machine Settings].
- *Proof Speed*
  The speed of proof test can be changed.
- *Hold Time*
  Change the value depending on the type of the coating material of the recoated fiber or the refractive index of UV curable material.

Selecting Proof Test Mode

Select the proof test mode to be used.

1. *Press the part where the name of the Proof Test Mode is displayed in [READY] screen, go to [Select Proof Test Mode], or touch icon goes to [Recoat Menu].*



Touch icon to return to [READY] screen

The proof test mode is changed

2. *Select the Proof Test Mode you wish to choose. The Proof Test Mode in [READY] screen is changed.*

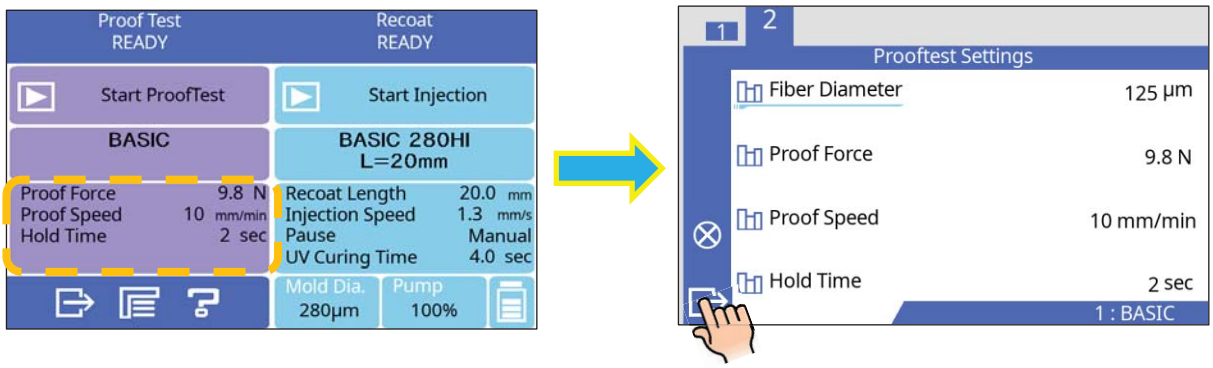
3. *Touch icon to go back to [READY] screen.*

- *Settings in all "BASIC" Modes are the same. Change the settings depending on operation.*
- *Proof Force may not reach the force set depending on the fiber coating or the fiber diameter.*

Checking or editing Proof Test Mode

Proof Testing parameters in each Proof test Mode can be modified. To edit parameters, follow the steps below:

1. *Press the part where the terms of the Proof Test Mode is displayed in [READY] screen*
2. *Select the parameter you wish to change in [Fundamental Setting].*
3. *Change the value of the parameter.*
4. *Touch icon to return to [READY] screen.*

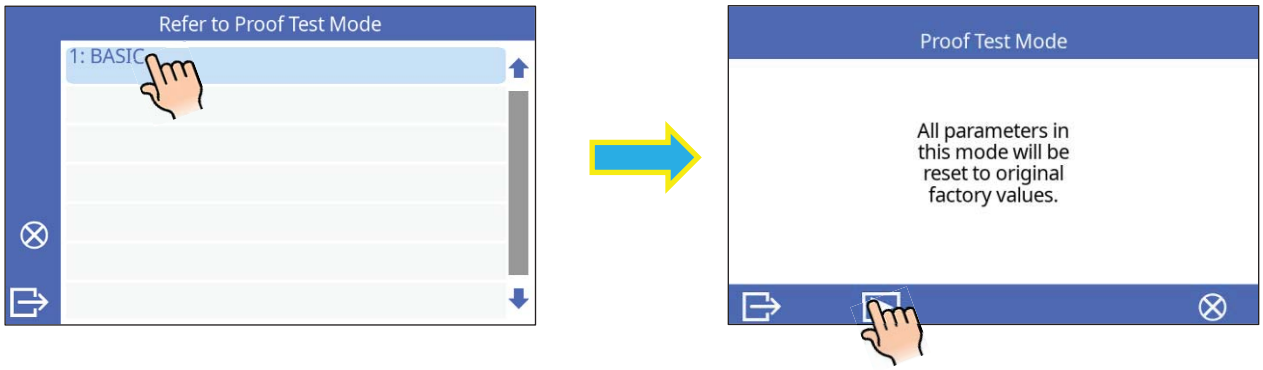


Initialization of the edited parameter

To return all parameters to the initial values after changing the values, follow the steps below.

s

1. *Select [Refer to Proof Test Mode] in [Fundamental Setting] screen.*
2. *Select the same data in [Select Proof Test Mode].*
3. *A confirmation message shows up and touch icon.*
4. *The initiation starts. Touch icon to return to [READY] screen.*

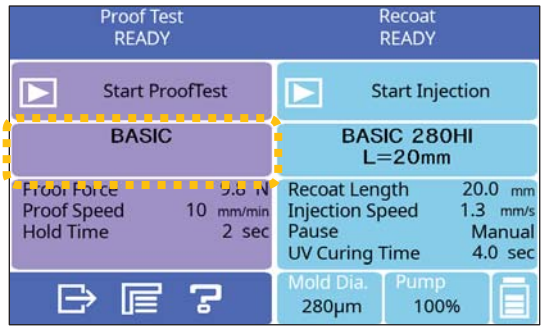


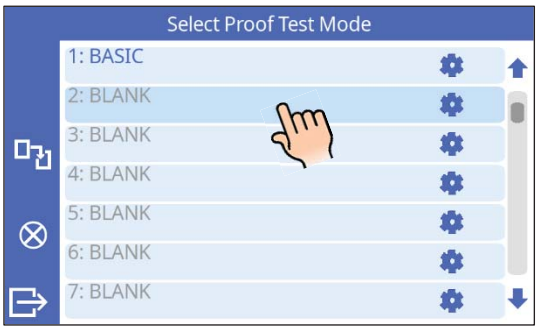
Creating or erasing proof test mode

How to create proof test mode

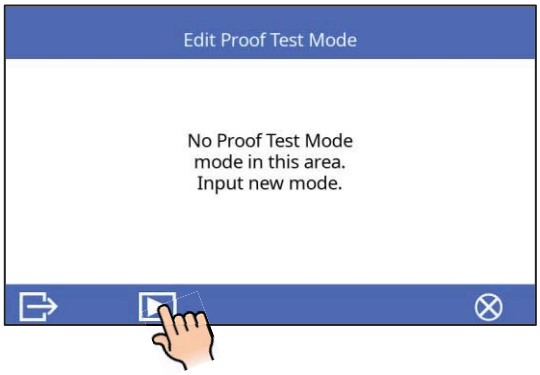
Standard proof test modes are stored when the Recoater is delivered, and all the other modes are displayed as [BLANK]. Follow the procedures below to add a proof test mode

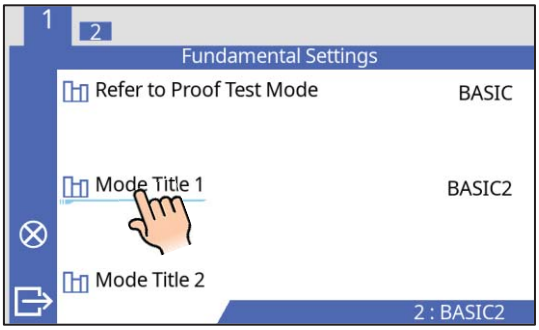
1. *Press the part where the Proof Test Mode is displayed in [READY] screen.*
2. *Select the line you wish to create a new test mode in [Select Proof Test Mode].*



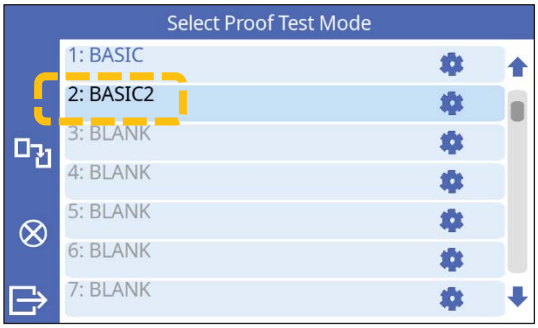


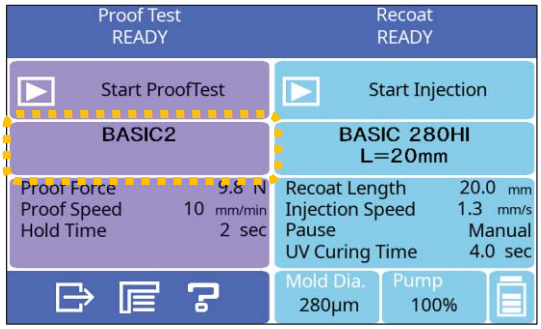
3. *A confirmation message shows up and touch* *icon.*
4. *A new test mode is created. Change the title menu to distinguish the other title.*
5. *The initiation starts. Touch* *icon to return to [READY] screen.*





6. *The title of the new test mode is displayed.*

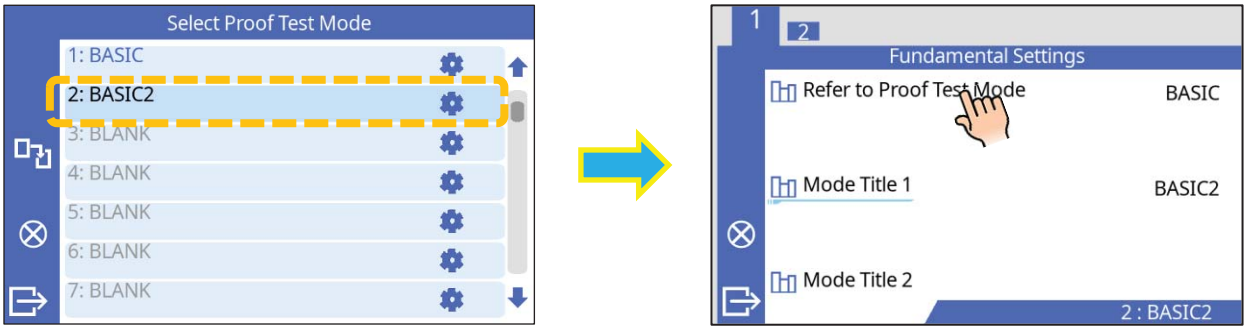




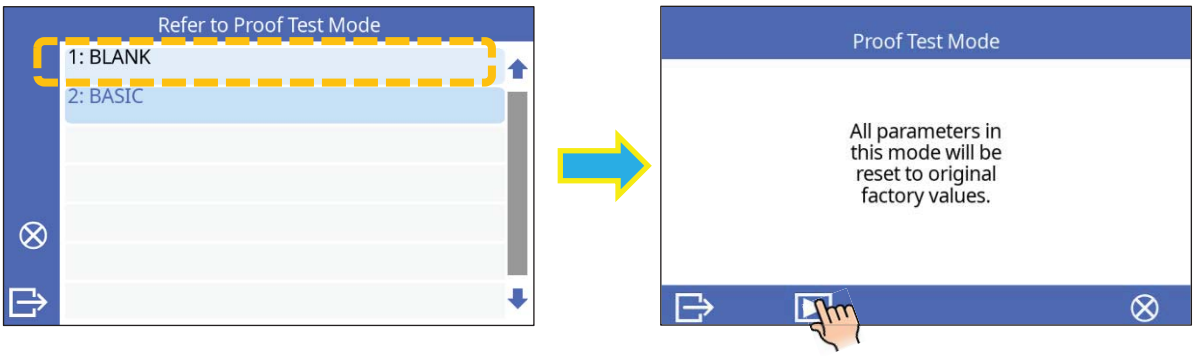
How to delete proof test mode

Proof test mode can be deleted. Follow the below steps to delete a proof test mode.

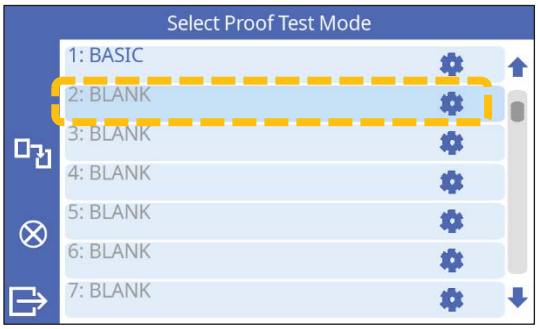
1. *Select the test mode you wish to delete. Touch icon to enter [Fundamental Settings] in [Select Proof Test Mode] screen.*



2. *Select the [Refer to Proof Test Mode.*
3. *Select "BLANK".*



4. *A confirmation message shows up and touch icon.*
5. *The initiation starts. Touch icon to return to [READY] screen*
6. *The "BLANK" is displayed in [Select Proof Test Mode].*

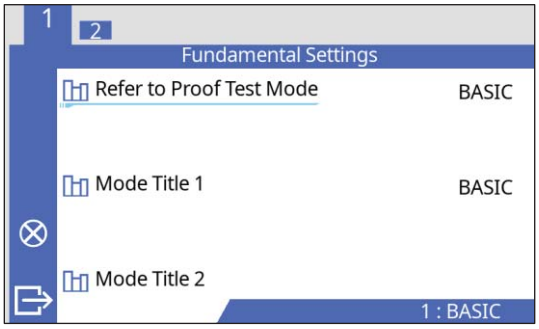


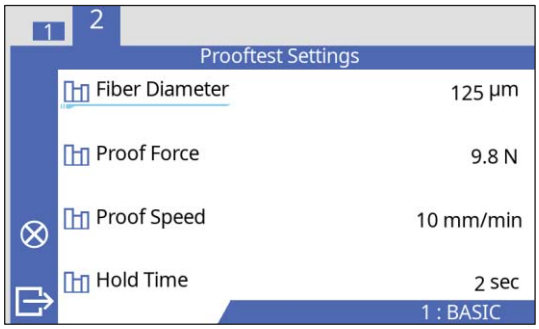
- *Mode No.1 cannot be deleted.*
- *Mode No.1 is automatically selected after deleting a proof test mode.*

Parameters of Proof Test Mode

Fundamental Settings

The parameters in all proof test modes are the same values when it is delivered. When a different mode is created, it can identify itself by changing the mode title.





Proof Test Settings

The unit of proof test force can be chosen form [kgf], [N], or [ksi].

Item	Description
Fundamental Settings	
Refer to Proof test Mode	List of proof test modes stored in database is displayed. A selected proof test mode stored in the database area is copied to a selected proof test mode in the user-programmable area.
Mode Title 1	Title for a proof test mode expressed in up to 11 characters.
Mode Title 2	Title for a proof test mode expressed in up to 11 characters. Title 2 is displayed under the Title 1 at the [READY] screen.
Proof Test Settings	
Fiber Diameter	Enter the cladding diameter of the fiber.
Proof Force [kgf]	Set the proof force. Select the unit from [kgf], [N], or [ksi] in [Indication Settings] in [Machine Settings].
Proof Force [N]	
Proof Force [ksi]	
Proof speed	Change the speed of proof test.
Hold Time	Set the hold time after the force reaches to setting force.

- *Settings in all "BASIC" Modes are same. Change the settings depending on operation.*
- *Proof Force may not reach the force set depending on the fiber coating or the fiber diameter.*

Memory of proof test results

This Recoater stores up to 5,000 proof test results.

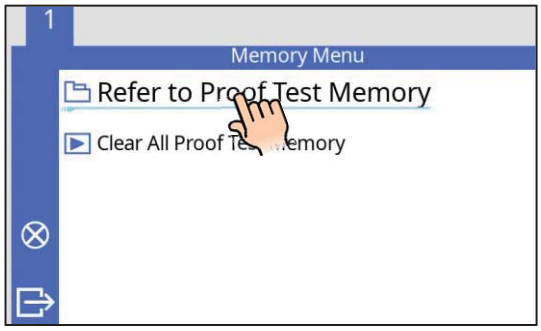
Reference or elimination of proof test results

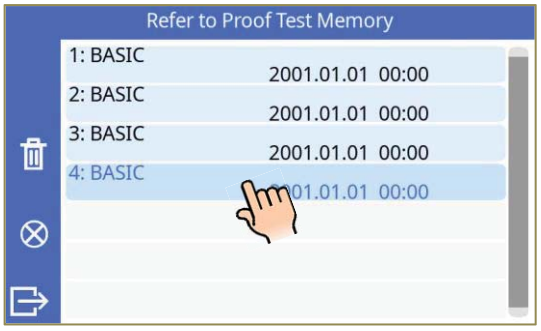
Proof test results stored in the memory can be displayed. Comments can be added or edited.

> ➢ *Memory data can be downloaded by USB. Refer to instruction manual of "Data Connection".*

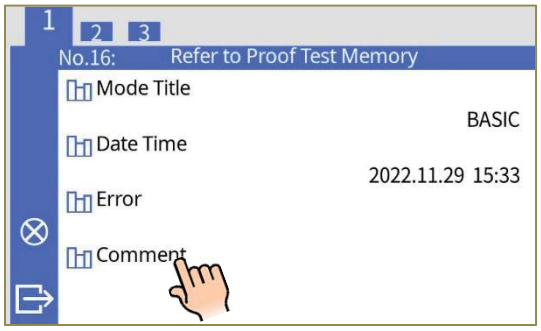
How to display the proof test result data

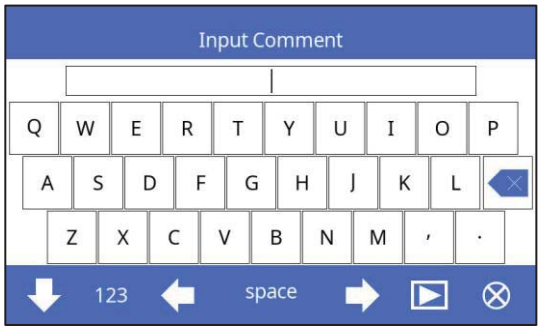
1. *Select [Proof Test Memory] in [Proof Test Menu] and select [Refer to Proof Test Memory].*
2. *The list of proof test results is displayed. Select the memory you wish to refer.*





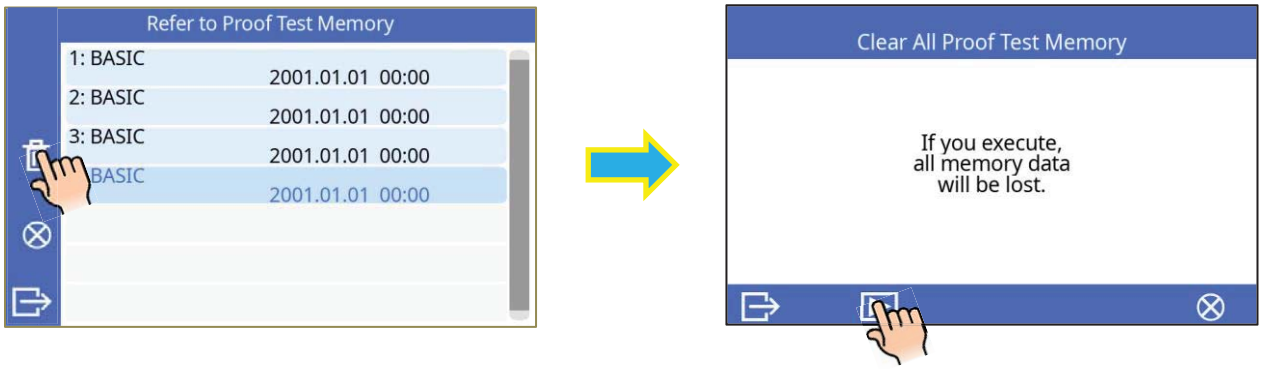
3. *The result is shown on the screen.*
4. *Touching the screen or pressing the* SET *key to enter the keyboard screen for editing the comment.*





How to delete the proof test result data

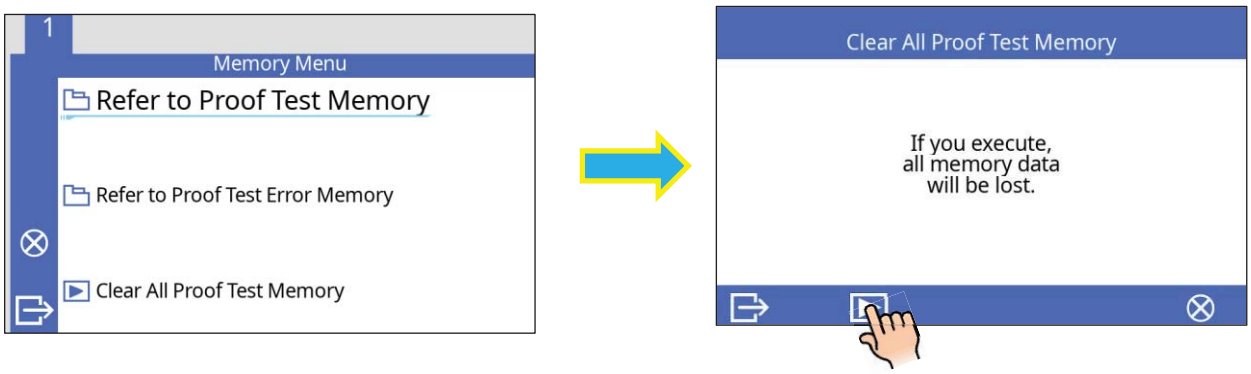
1. *Select the data you wish to delete in [Refer to Proof Test Memory] and touch icon on the left.*
2. *A confirmation message shows up. Touch icon after confirming.*
3. *The selected data is deleted from the memory.*



Clear all proof test memory data

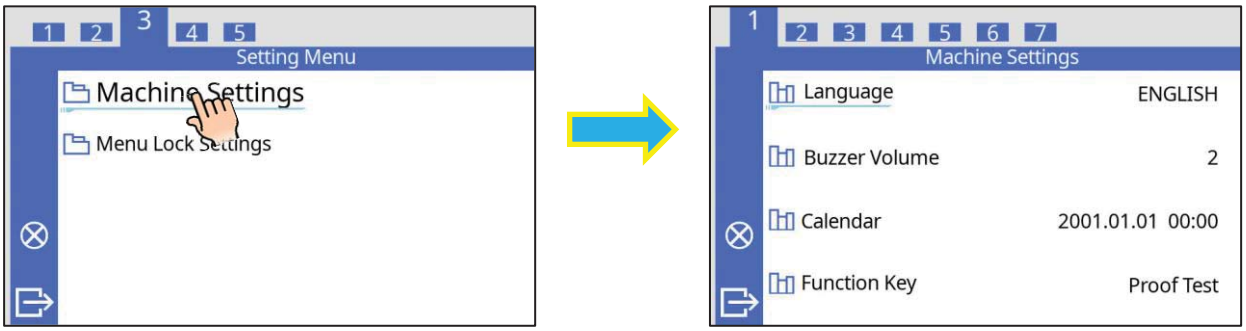
All recoat results can be cleared at once.

1. *Select [Clear All Proof Test Memory] in [Memory Menu].*
2. *A confirmation message shows up. Touch icon to delete all after confirming.*
3. *All the proof test results are deleted.*

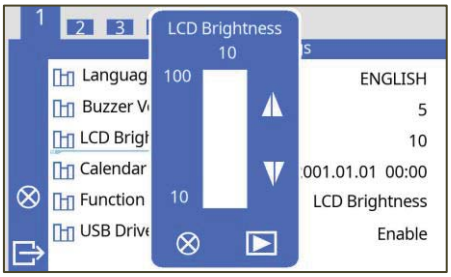
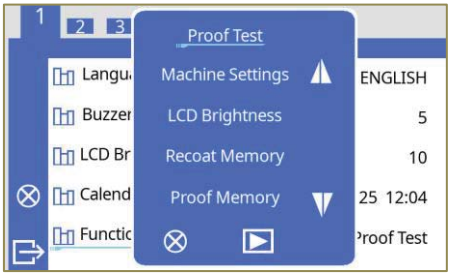


Machine Settings

Settings for the Recoator can be changed in [Machine settings].
Select [Machine Settings] in [Setting Menu].



Machine Settings

Item	Description
Basic Settings	
Language	Sets the Language to be displayed on the screen.
Buzzer Volume	Sets the sound volume of the buzzer.
Calendar	Sets the time and date.
LCD Brightness	Adjusts the brightness of the monitor. 
Function key (Fn key)	Pressing the sheet key Fn opens the menus below. Proof Test: Start, stop, restart of the proof testing. Machine Setting : Displays [Machine Setting] screen. LCD Brightness : Adjusts the brightness of the monitor. Recoat Memory : Displays the Recoat Memory. Proof Memory : Displays the Proof Test Memory. The factory setting is [Proof Test]. 
USB Drive Mode	Sets the USB Drive Mode enable or disable. If this mode is enabled and the Recoater and any PC are connected with a USB cable, the Recoater enters the USB Drive Mode. See Section [Install the instruction Manual and the Utility Software] in the quick reference guide.

Item	Description
Indication Settings	
Resin Injection Quantity Unit	*Sets the displayed unit of the resin injection quantity.*
Proof Force Unit	*Sets the displayed unit of the proof test.*
Bottle Counter Indication	*Changes the indication of the Bottle Counter to ON or OFF.*
Resin Expire Alarm Indication	*Changes the indication of the alarm message to ON or OFF.*
Recoater Settings	
Mold Diameter	*Sets the diameter of the Recoat Mold attached to the Recoator.*
Purge Cycle	*Sets the injection amount of the UV curable material when pressing UP key. The larger the number, the larger the injection amount.*
Pump Reverse Cycle	*Sets the pump cycle when reversing the UV curable material from the pump to the UV resin bottle.* *The larger the number, the longer the reversing time.*
Auto Resin Replacement	*Sets ON/OFF setting for automatically filling the UV curable material in the pump.* *When setting ON, the pump will be always filled with the UV curable material 100% automatically.* *The default setting is to be "OFF".* *(Note) When setting "ON", the pump may cause an unstable amount of the UV curable material inside of the pump.*
Mold Light	*Sets ON/OFF setting for LED light.* *When setting "ON", the LED light near the Recoat mold lights up and makes the injection of the UV curable material to observe easier.*
Proof Tester Settings	
Fiber-Protection-Cover Sensor	*Changes the sensor to valid or invalid.*
Pause (Before Auto. Reset)	*Sets the waiting time until the tension mechanism resets after opening both right and left Sheath Clamp after finishing recoat operation. When "Manual" is selected, press Fn key for reset movement.*
Bottle Counter Settings	
Filling Volume	*Enter the amount of UV curable material filled in the Bottle.*
Consumption Factor	*Adjusts the consumption amount of UV curable material caused by viscosity change of the UV curable material by temperature, humidity, etc.*
Refill Warning	*Sets the amount to indicate the reduction alarm of the material.*
Resin Expire Settings	
Expire Date	*Enter expiry date on the bottle to be used.*
Alarm Settings	*Sets the expiration date to indicate the alarm.*
Power Saving Timer Settings	
Sleep	*Sets Sleep time of the LCD monitor and sets the time of turning off the power of the Recoater.*
Shut Down	

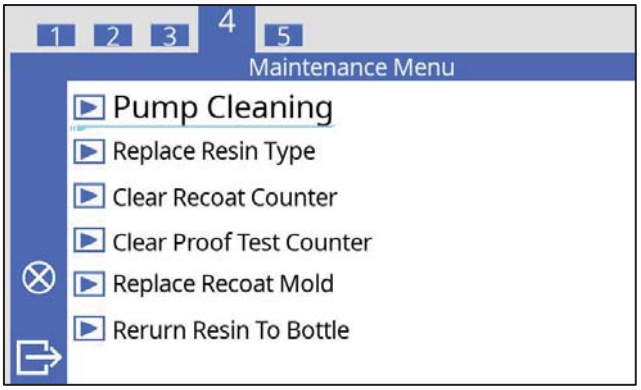
Menu Lock Settings

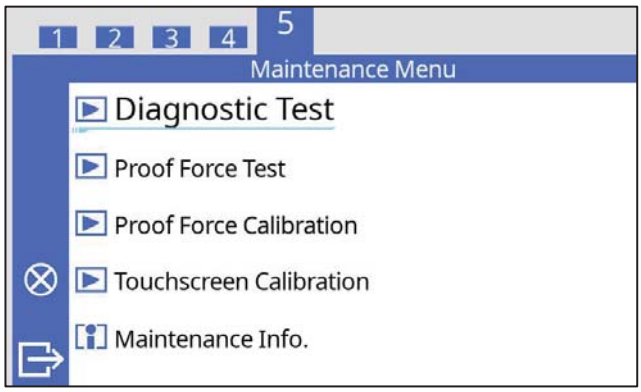
Supervisor can limit the function by [Menu Lock Settings].
When you enter the Menu Lock Settings, you need to enter the password.
The factory value is "0".

Item	Description
Password Setting	
Menu Lock Password	*Changes the password to access the [Menu Lock Settings].*
Recoat Mode	
Select Recoat Mode	*Setting to "Disable" prevents unauthorized editing and selecting of recoat modes.*
Edit Recoat Mode	
Proof Test Mode	
Select Proof Test Mode	*Setting to "Disable" prevents unauthorized editing and selecting of proof test modes.*
Edit Proof Test Mode	
Memory	
Clear All Recoat Memory	*Setting to "Disable" prevents unauthorized deleting of result data on the memory.*
Clear All Proof Test Memory	
Machine Settings	
Basic Settings	*Setting to "Disable" prevents unauthorized editing of the [Machine Settings] menu.*
Indication Settings	
Recoater Settings	
Proof tester Settings	
Bottle Counter Settings	
Resin Expiration Settings	
Power Saving Timer Settings	
Maintenance	
Pump Cleaning	*Setting to "Disable" prevents operation of various functions related to the [Maintenance Menu].*
Clear Recoat Count	
Clear Proof Test Counter	
Replace Recoat Mold	
Return Resin To Bottole	
Maintenance	
Diagnostic Test	*Setting to "Disable" prevents operation of various functions related to the [Maintenance Menu].*
Proof Force test	
Proof Force Calibration	
Touch Screen Calibration	

Maintenance

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





Item	Description
Maintenance Menu	
Pump Cleaning	*Clean and wash the UV curable material in the tubes of the Pump Head unit before transportation of the Recoater. Follow the instruction message displayed on the screen.*
Clear Recoat Counter	*Set the Recoat Count "0". The actual count number is shown in the Maintenance Menu.*
Clear Proof Test Counter	*Set the Proof Test Count "0". The actual count number is shown in the Maintenance Menu.*
Replace Recoat Mold	*Use this menu when replacing the Recoat Mold. Follow the instruction message displayed on the screen.*
Return Resin to Bottle	*Use this menu when returning the UV curable material from the pump to the UV resin bottle.*
Maintenance Menu	
Diagnostic Test	*Allows the operator to perform a simple check of the electric parts and Recoater performance*
Proof Force Test	*use this menu when checking the proof force. The designated optional device is required for this calibration.*
Proof Force Calibration	*Calibrates the proof force. The designated optional device is required for this calibration.*
Touch Screen Calibration	*Calibrates the touch screen. Follow the instruction message displayed on the screen.*
Maintenance Info.	*Displays the Maintenance Information.*

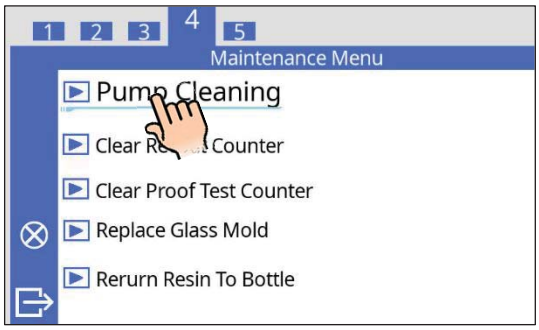
Pump Cleaning / Replace resin

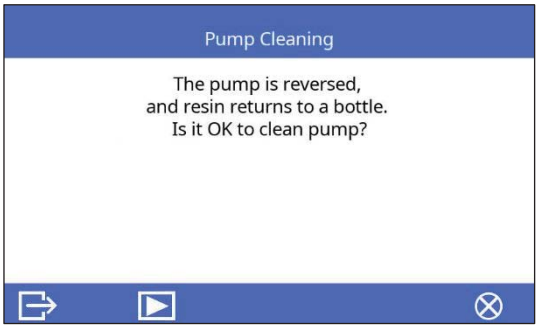
[Pump Cleaning] mode can clean and wash the UV curable material in the Pump and tubes unit before transportation of the Recoater, storing it for a long time or replace the type of the UV curable resin.

Operation procedure

1. *Select [Pump Cleaning] in the [Maintenance Menu].*
2. *A confirmation message shows up. Touch* *icon to execute.*

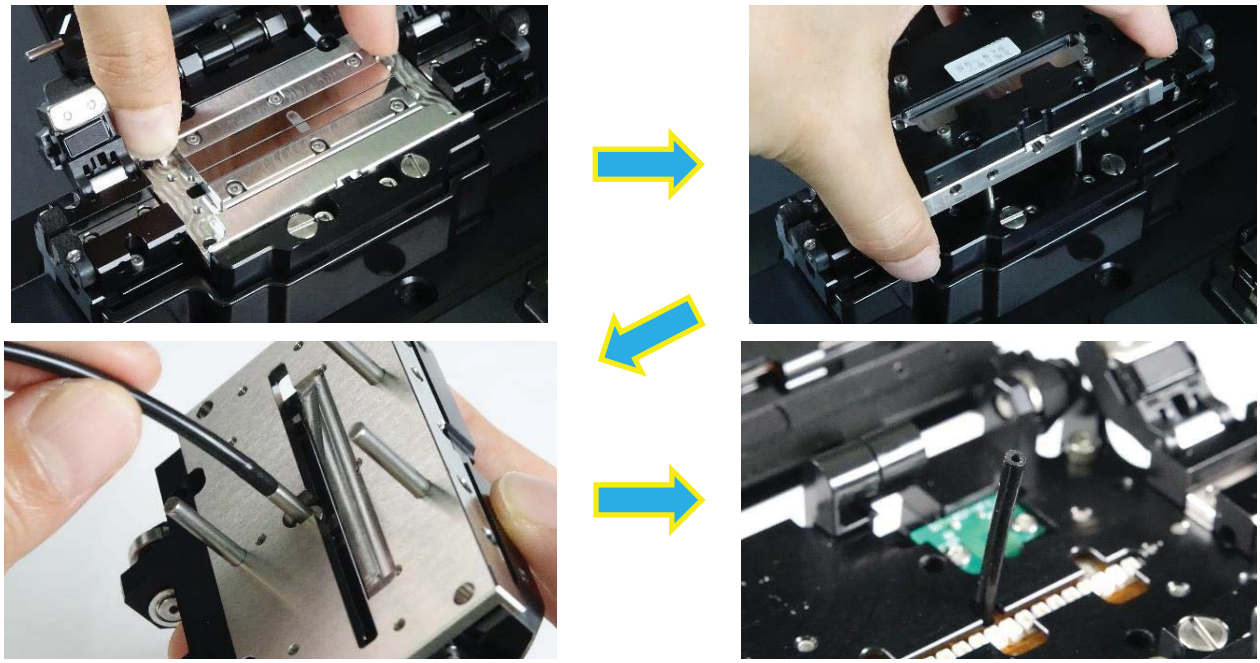
   After running the Pump in reverse to return the UV curable material in the tubes to the Bottle, "Turn the power off" message is shown in the screen.
3. *Turn the power off as following the messages.*





4. *Remove the UV resin bottle that is attached in the UV pump unit located in the left side.*
   Wipe off the UV curable material on the tube.

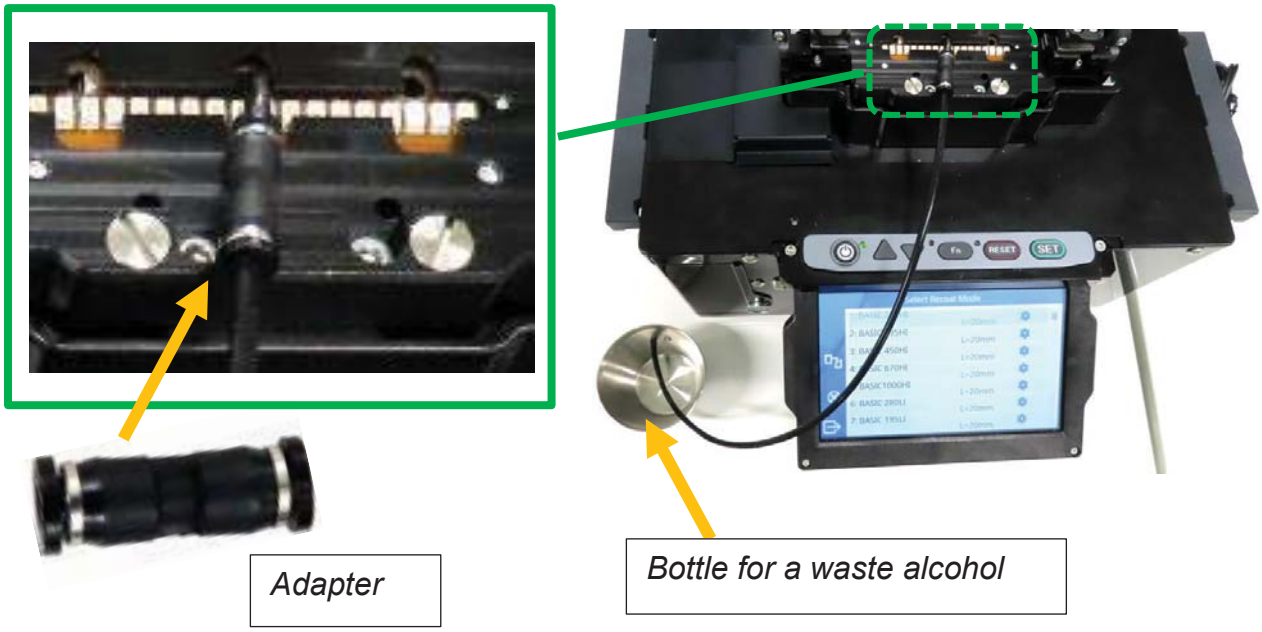
5. *To prevent the alcohol used during cleaning from entering the device, remove the Recoat Mold from the Recoator body and detach the tube*



6. *Attach the bottle with alcohol.*

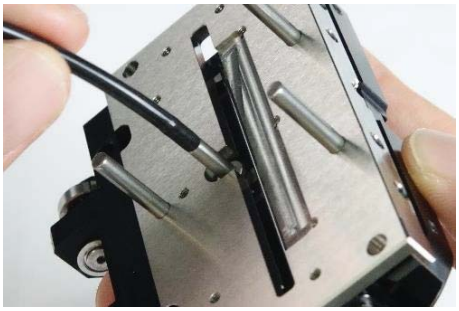
7. *Prepare the adapter and the extension tube. Use an adapter is an applicable tube outer diameter of φ3. Fujikura recommend the PU3MEG manufactured by Pisco Ltd.*

8. *Attach an adapter and an extension tube to the tube from the Recoat Mold. Place a bottle for a waste alcohol at the end of the extension tube.*



9. *Turn the Recoater power ON and follow the displayed instruction message on the screen.*
10. *After starting the cleaning, the alcohol will be discharged into the bottle.*
11. *Continue to clean until there is no contamination with UV curable material. If the alcohol of cleaning is all gone, pause the cleaning, refill the alcohol, and restart the cleaning.*
12. *If the wasted alcohol is no longer contaminated with the UV curable material, stop the cleaning and turn the power off.*

13. *Attach the Recoat Mold back to the device body.*



14. *To clean the resin into the Injection adapter of Recoater mold, turn the Recoator power ON and then press UP key to discharge the UV curable material by injected alcohol.*

➢ *Be sure to wipe the discharged alcohol. Otherwise overflowing alcohol may cause machine failure.*

15. *Continue to inject the alcohol until there is no contamination of the UV curable material.*
16. *After confirming the UV curable material is no longer contaminated, return the alcohol inside the tube and pump to the UV resin bottle by selecting [Return Resin To Bottle] menu.*
17. *Reset the recoat count.*
18. *Turn the Recoater power OFF.*
19. *Remove the bottle with cleaning alcohol, and then attach the empty bottle.*
20. *Leave the device for more than 12 hours to dry alcohol off inside of the device.*
21. *After that, put new UV resin into the bottle and inject it. Make sure the UV resin is transparent.*

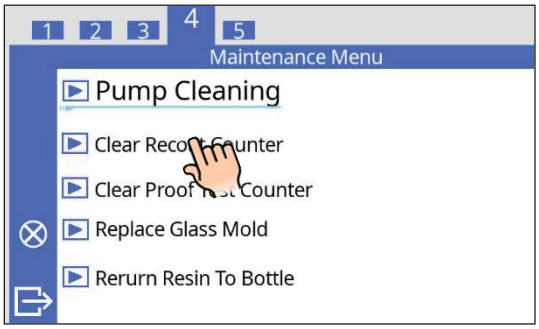
▪***Be sure to dry the pump for more than 12 hours after washing it.***

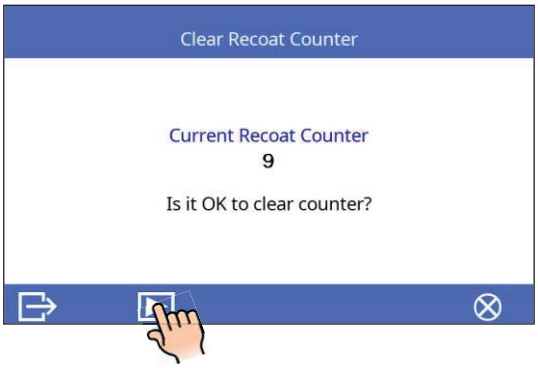
Clear Recoat Count

This function enables the stored number of recoat to be reset.
Use this function when replaced the UV curable material.

Operation procedure

1. *Select [Clear Recoat Counter] in Maintenance Menu.*
2. *A confirmation message shows up. After confirming, touch* *icon.*
3. *Initialize [Clear Recoat Counter] starts.*





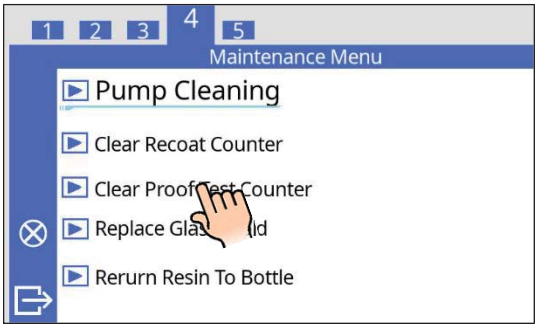
- *This function is included in the [Replace Mold] function.*
- *The number of recoat in the "Total Recoat Count" field displayed on the [Maintenance Info.] cannot be reset.*

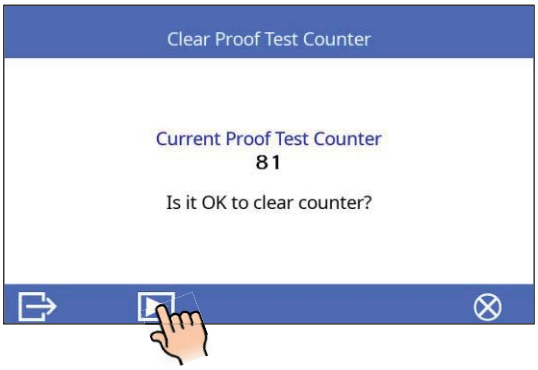
Clear Proof Test Counter

This function enables the stored number of proof test to be reset.
Use this function when you wish to initialize the counter after adjusting the proof force or inspection work.

Operation procedure

1. *Select [Clear Proof Test Counter] in [Maintenance Menu].*
2. *A confirmation message shows up. After confirming, touch* *icon.*
3. *Initialize [Clear Recoat Counter] starts.*





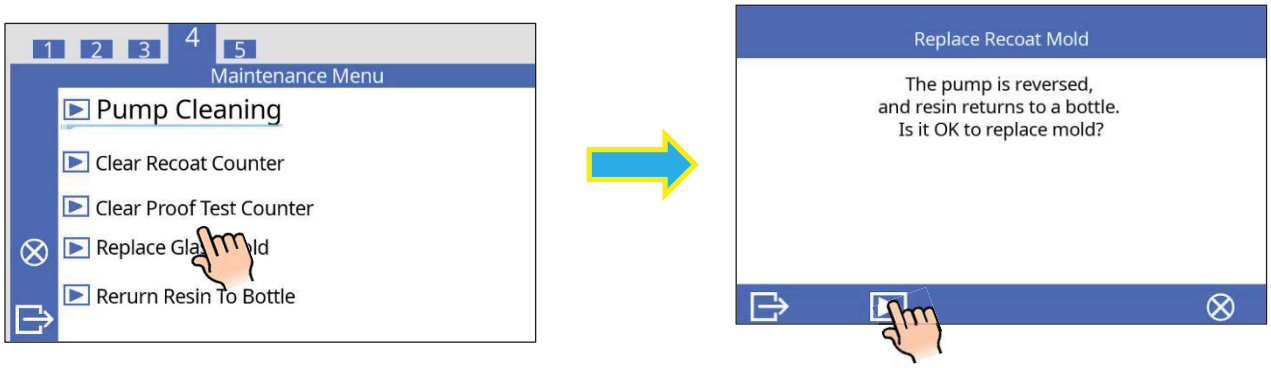
- *The number of proof test in the "Total Proof Test Count" field displayed on the [Maintenance Info.] cannot be reset.*

Replace Recoat Mold

When the Recoat Mold is replaced, follow the procedures below.

Operation procedure

1. *Select [Replace Recoat Mold] in [Maintenance Menu].*
2. *A confirmation message shows up. After confirming, touch* *icon.*



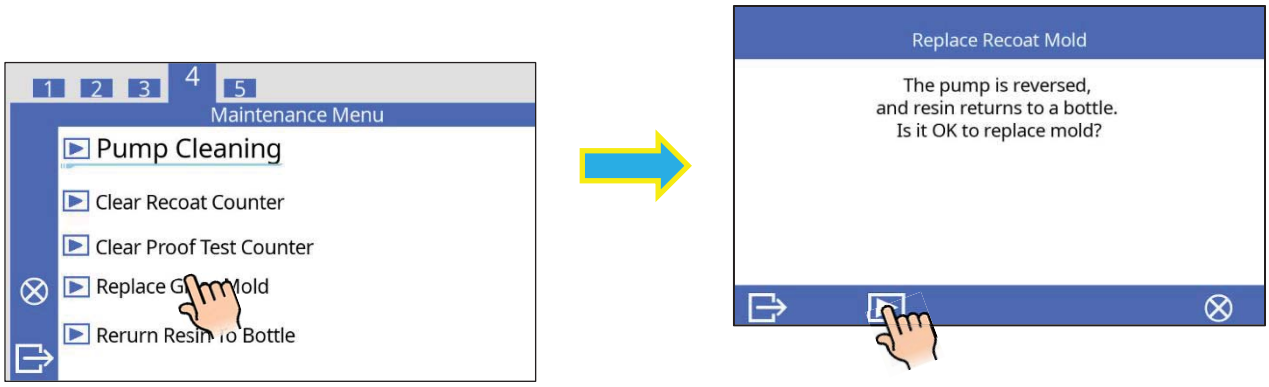
3. *After cleaning the tube, a message shows up and instruct to turn off the Recoater. Follow the message and turn the power off.*
4. *Remove the Recoat Mold and pull out the tube connected to the injection port.*
5. *Attach the tube to a new Recoat Mold and attach the Recoat Mold back to the body.*
6. *Turn on the Recoater and confirm the diameter of the Recoat Mold.*
7. *Initialize the recoat count.*

Return UV curable material to bottle

This function enables to return the UV curable material in the tubes and the pump to the built-in UV resin bottle.

Operation procedure

1. *Select [Return Resin To Bottle] in [Maintenance Menu].*
2. *A confirmation message shows up. After confirming, touch* *icon*
3. *The recoater starts returning the UV curable material stays in the tubes and the pump to built-in UV resin bottle.*



Diagnostic Test

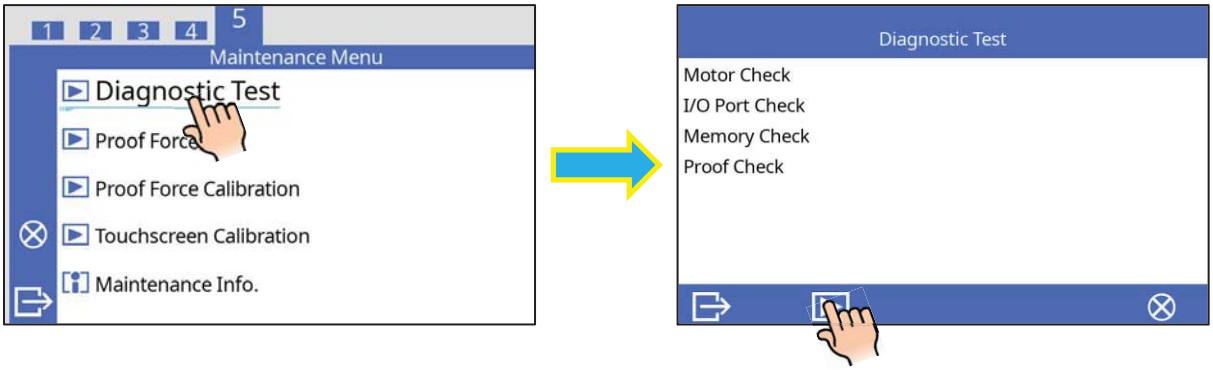
The Recoater has a built in diagnostic test feature that allows the operator to perform a simple check of the electric parts and Recoater performance.
The inspection items are as follows.

Inspection items for Diagnostic Test

Inspection Item	Description
Motor Check	*Check the Motor movement.*
I/O Port Check	*Checks for normal operation of the input and output terminals of the internal circuit.*
Memory Check	*Checks the memory of the internal circuit.*
Proof Check	*Checks around the Proof Unit.*

Operation procedure

1. *Select [Diagnostic Test] in [Maintenance Menu].*
2. *Touch icon below and starts the diagnostic test.*



3. *After completing the [Memory Check], the device pauses and all the results are displayed on the screen.*
   If you want to perform [Proof Check], touch icon. If you want to finish the [Proof Check], touch icon below right.

Proof Force Test/Adjustment

This function enables the check of proof force using a force gauge; requiring the Force Gauge Adapter FGA-02 and the Force Gauge FGP-20 manufactured by NIDEC-SHIMPO Corporation.

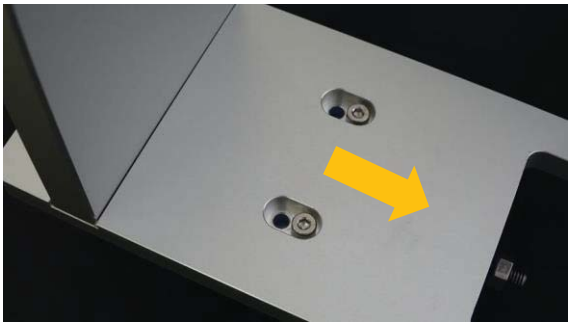
**The setting of inspection force is different between FSR116 and FSR117.*

1. Attaching Force Gauge Adapter

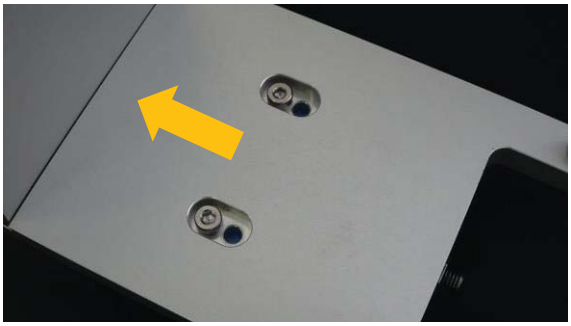
Attach the Force Gauge FGP-20 to the Force Gauge Adapter FGP-02 (optional part) with the included 4 screws. The attaching position differs depending on the model.

Force Gauge Adapter :FGA-02

Force Gauge attached



Attaching position for FSR116; front side of the Force Gauge

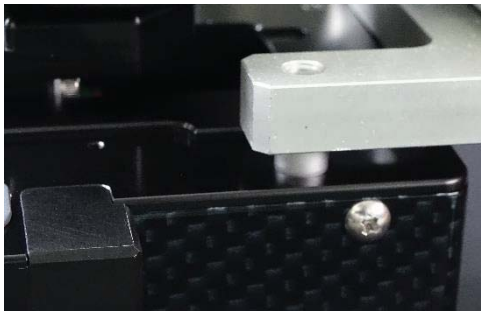


Attaching position for FSR117; rear side of the Force Gauge

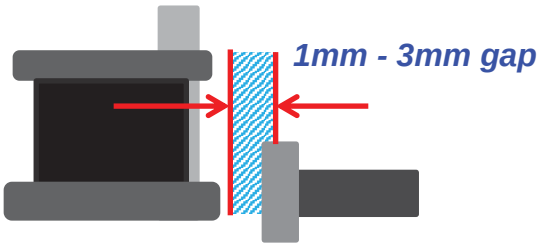
- *The Force Gauge Adapter [FGA-02] is optional part.*
- *The attaching position of the force gauge is different between FSR116 and FSR117.*

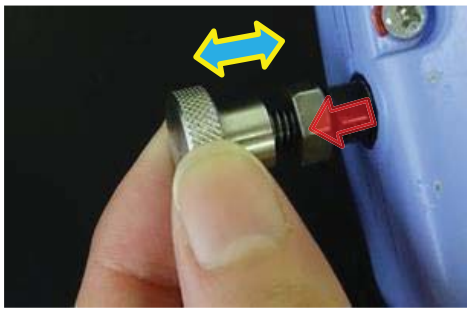
Attaching Force Gauge Adapter to Recoater

1. *Attach the Force Gauge Adapter at the end to the force gauge. Set the Force Gauge Adapter to the right side of the Recoater After attaching the Force Gauge Adapter, pull the Force Gauge to the arrow direction to eliminate the slack.*



2. *Select the [Proof Force Test / Proof Force Calibration] in the [Maintenance Menu] and the Proof function is reset, adjust the position of the attachment so that the end of the attachment is within 1 to 3mm of the clamp. Fix it with the nuts.*





Fix the gap with the nuts.

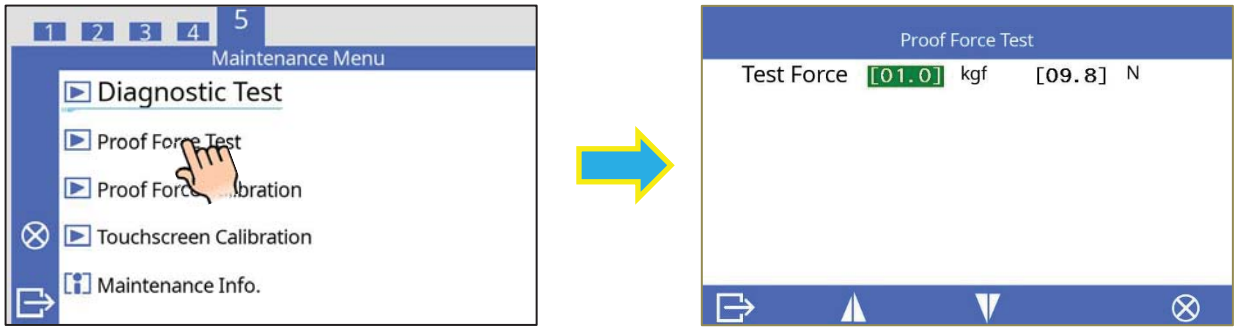
3. *Set zero point adjustment and perform the proof force test or the proof force calibration.*

- *Make sure that there is a gap between the Force Gauge end and the right Clamp (1-3mm).*
- *Pull the Force Gauge Adapter to the right side to eliminate the slack when attaching.*
- *Perform the proof force test on the flat place and confirm that there is no rattling, otherwise it may cause injury.*

- *[Proof Force Test/Proof Force Calibration] are in the [Maintenance] of the [Maintenance Menu].*

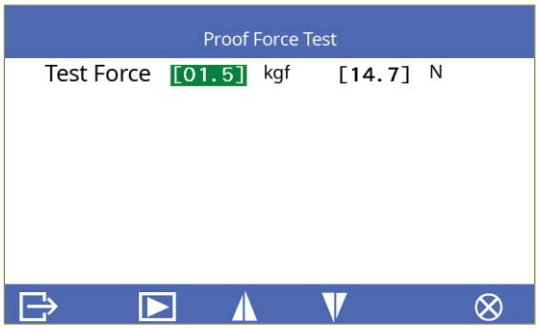
Proof Force Test

1. *Select [Proof Force Test] and execute] in [Maintenance Menu].*
2. *Attach the Force Gauge by referring the chapter "Proof Force Test/Adjustment" in part "Maintenance Menu".*
3. *Enter the proof force value using UP/DOWN key.*



4. *Open the left lever of the clamp.*

5. *Tocuh icon. The right clamp stops at the set value.*
6. *Check if the value of the Force Gauge and the set value are the same.*



- *Be sure that there is a gap (3mm or less) between the Force Gauge tip and the right Clamp.*
- *Pull the Force Gauge Adapter to the right side to eliminate the slack between it and the hole of the Recoater.*
- *It is dangerous to use in the state where the Force Gauge Adapter inclined. Use it on flat table and confirm that there is no gap between it and the table.*

Proof Force Calibration

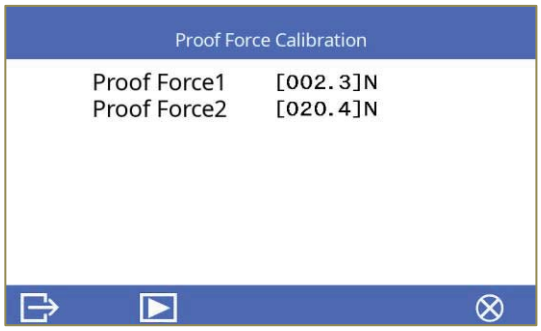
This function enables the calibration of the proof force.

**The setting of proof force is different between FSR116 and FSR117*

Operation procedure

1. *Select [Proof Force Calibration] in [Maintenance Menu].*
2. *Attach the Force Gauge by referring the chapter "Proof Force Test/Adjustment" in part "Maintenance Menu".*
3. *Set the unit of the force gauge to the [N] and press PEAK button.*
4. *Open the left lever of the clamp.*

5. *Touch icon. The right clamp stops at Proof Force 1 while pushing the Force Gauge.*
6. *Enter the displayed value on the Force Gauge.*



7. *After entering the "Proof Force 1" value, touch icon to set the "Proof Force 2" and operate the same procedure as "Proof Force 1"*

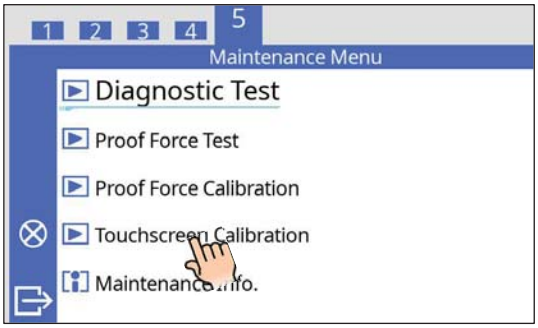
- *Be sure that there is a gap (3mm or less) between the Force Gauge tip and the right Clamp.*
- *Pull the Force Gauge Adapter to the right side to eliminate the slack between it and the hole of the Recoater.*
- *It is dangerous to use in the state where the Force Gauge Adapter inclined. Use it on flat table and confirm that there is no gap between it and the table.*

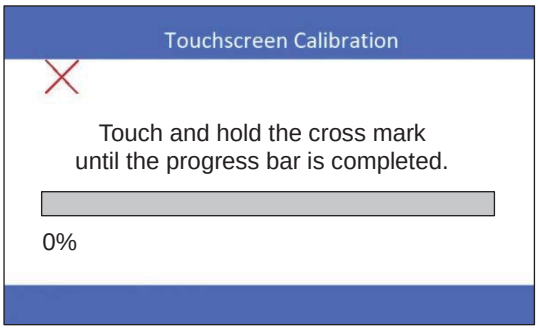
Touch screen Adjustment

This function enables to adjust the touch screen.
Try this function if the touch screen does not respond when you press it.

Operation procedure

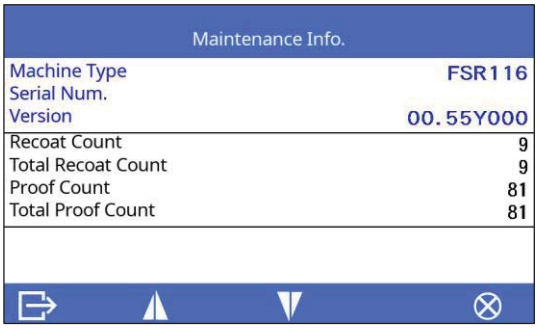
1. *Select [Touchscreen Calibration] in [Maintenance Menu].*
2. *The screen changes and shows the instruction messages. Please follow them.*

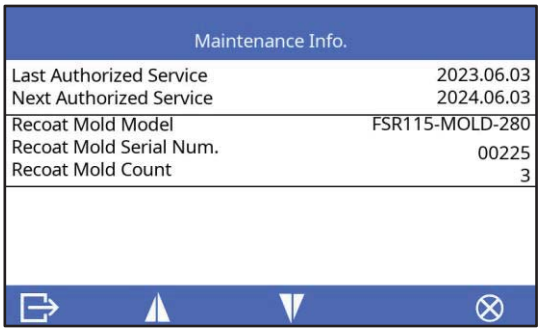




Maintenance Information

Enable to check the software version, the serial number, the status of use, and so on….
You can switch the screen with the icon at the bottom of the screen.





Select [Maintenance Info.] in [Maintenance Menu].

Item	Description
Machine type	*Model name of the Recoater*
Serial Number	*Serial number of the Recoater.*
Version	*Version number of the software.*
Recoat Count	*The number of recoat after the Recoat Mold replacement. Performing the function [Clear Recoat Count] resets this parameter to zero.*
Total Recoat Count	*The total number of recoat after the Recoater is shipped.*
Proof Count	*The number of proof test. Performing the function [Clear Proof Test Counter] resets this parameter to zero.*
Total Proof Count	*The total number of proof test after the Recoater is shipped.*
Last Authorized Service	*The date of last authorized service.*
Next Authorized Service	*The scheduled date of next authorized service.*
Recoat Mold Model	*Display the Recoat Mold Model.*
Recoat Mold Serial Number	*Serial Number of the Recoat Mold.*
Recoat Mold Count	*Display how many times the attached mold has been used. If the power is not turned off in the proper procedure, the correct number of uses will not be stored.*

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

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

Error Message	Reason	Solution
Recoat Mold Cover Open Error	*・The Recoat Mold is opened.*	*・Do not open the Recoat Mold during recoat operation. Redo the recoat operation when this error happens.*
Proof Test Fiber Broken	*・Dust or dirt is on the rubber surface of the Clamps.* *・The fiber is not loaded correctly.* *・The fiber is broken.*	*・Clean the rubber pads of the Clamps. Refer to [Pre-operation Cleaning and Checking] section.* *・Close the Clamps completely after loading a fiber.* *・The broken fiber is not used for the proof test*
Proof Test Slipped or Clamp Opened	*・Dust or dirt is on the rubber surface of the Clamps.* *・The Clamp is open* *・Depending on the coating material or diameter of the fiber.*	*・Clean the rubber pads of the Clamps. Refer to [Pre-operation Cleaning and Checking] section.* *・Reduce the proof force.*
Proof Test Proof Cover open Error	*・Fiber Protection Cover is removed.*	*・Do not remove the Fiber Protection Cover during proof test operation.*

Power Supply

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

(2) Power does not turn off when pressing ON/OFF key.
- Press and hold the key until the LED color changes from green to red.

(3) Method to change the power saving function settings
- Refer to [Machine Settings] section.

Recoat Operation

(1) Does not inject UV curable material.
- Check the amount of the material in the Bottle.
- Check all the connections of the tubes.
- When using the Recoater for the first time, it takes a long time to inject the UV curable material. Press UP key a several time in the READY screen to inject the UV curable material until the UV curable material comes out.

(2) UV curable material leaks a lot on the Recoat Mold.
- Clean the Recoat Molds with alcohol-impregnated lint-free tissue or gauze.
- Check the coating diameter of the fiber whether it is smaller than the diameter of the Recoat Mold.
- Check whether the fiber is in the groove of the Recoat Mold.

(3) Short of injection of the UV curable material.
- Clean the Recoat Molds with alcohol-impregnated lint-free tissue or gauze.
- Check the injection amount by opening the Top Cover after injecting. If the material does not reach the target position, press UP key for additional injecting.
- The injection amount changes depending on temperature or the viscosity of the UV curable material. Adjust [Resin Injection Quantity] in [Recoat Mode].

(4) The UV Curable material does not cure.
- Increase the curing time.
  If no effect after increasing the UV curing time, the UV lamp might be broken.

(5) There is a big fin on the recoated part.
- Confirm whether the Recoat Mold is closed completely. Confirm same things as item (2).
- UV Curing Time may be too long. Reduce the UV Curing Time.

Proof Test Operation

(1) Proof test does not start.
- Attach the Fiber Protection Cover before starting the proof test.

(2) Fiber is broken.
- Reduce the proof force.
- Perform [Proof Force Test].
- If the measured proof force is different from the set value, perform [Proof Force Calibration].
- Recoating a fiber does not improve its tensile strength. Special high strength equipment is necessary to achieve high tensile strength splicing of 1kgf or more.

(3) Fiber Slipped or Clamp Opened
- Fiber slipped due to dust or dirt on the rubber surface of the Clamps. Refer to [Pre-operation Cleaning and Checking] section.
- The proof force dose not reach to the target force depending on the coating material or diameter of the fiber.

Supervising

(1) What functions can be disabled.
- See [Menu Lock Settings] section.

(2) Method to lock “selection” or “editing” of Recoat or Proof Test mode
- See [Menu Lock Settings] section.

(3) Method to set parameters of Recoat or Proof Test mode from a PC
- Refer to the communication software “Data Connection” stored in the Recoator.

(4) Forgot password
- Contact the authorized distributor.

Other Functions

(1) Increase the Add Quantity.
- Change the value of “Add Quantity” in [Recoat Settings].

(2) Excess UV curable material on waiting state.
- Some UV curable material may leak due to changes in temperature and atmospheric pressure. This is not a malfunction.

(3) The screen is dark.
- Adjust the brightness in [Machine Settings].

(4) Method to download recoat and proof test results from the Recoater to PC
- Refer to the instruction manual “Data Connection” stored in the Recoator. Contact the authorized distributor for further inquiries.

FCC notices (U.S. only) and other regulation information

The optical fiber recoater FSR116/117 uses RFID technology. Typical certification or regulations are below.

United States FCC

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

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 I' 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 Setting menu.
Step1: Select "Menu" button
Step2: Select "Maintenance Info."
Step3: Push the down button to display "Certificate"

Guarantee

BEST QUALITY SERVICE
- SINCE 1978 -

Guarantee period and limits

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

1. *Trouble or damage due to natural disaster.*
2. *Trouble or damage due to mishandling.*
3. *Trouble or damage due to handling in disregard of the operating procedures or instructions described in the instruction manual.*
4. *Trouble or damage of the Recoat Mold except first shipment from our factory.*
   **Take special precaution in protecting this machine when transporting it or when it is stored for a long time without use. In case of transporting or storing Recoater for a long time, insert a dry lint free tissue between the upper and lower Recoat Mold plates. Please affix the upper Recoat Mold plate with adhesive tape so that the Recoat Mold does not open easily.*

   Please note the memory contents, such as recoat and proof test results may be lost depending on the kind of repair.

Necessary information needed for repair

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

1. *Your full name, section, division, company, address, phone number, fax number and e-mail address.*
2. *Model name and serial number of the Recoater.*
3. *Problems encountered*
   What problems did your Recoater get into and when?
   What is its present operational state?
   The state of the monitor and the contents of the relevant error message etc.

Transporting the Recoater

Since the Recoater 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 Recoater

Please consult the authorized distributor first.

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, SOUTH CAROLINA 29334
U.S.A.
General inquiries: +1-800-235-3423, Option 2
Service & support: +1-800-866-3602
P.O.Box 3127 Spartanburg, SC 29304-3127
URL https://www.aflglobal.com

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

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