RWD

DSC-400
Single Cell Suspension Dissociator

User Manual A

ООО «Диаэм»
Москва
ул. Магаданская, д. 7, к. 3 ■ тел./факс: (495) 745-0508 ■ sales@dia-m.ru
www.dia-m.ru

С.-Петербург
+7 (812) 372-6040
spb@dia-m.ru

Новосибирск
+7(383) 328-0048
nsk@dia-m.ru

Воронеж
+7 (473) 232-4412
vrn@dia-m.ru

Йошкар-Ола
+7 (927) 880-3676
nba@dia-m.ru

Красноярск
+7(923) 303-0152
krsk@dia-m.ru

Казань
+7(843) 210-2080
kazan@dia-m.ru

Ростов-на-Дону
+7 (863) 303-5500
rnd@dia-m.ru

Екатеринбург
+7 (912) 658-7606
ekb@dia-m.ru

Кемерово
+7 (923) 158-6753
kemerovo@dia-m.ruu

Армения
+7 (094) 01-0173
armenia@dia-m.ru

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The device is used by following the operating instructions.

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The components are disassembled, stretched or redebugged;

The device is repaired or modified by an unauthorized person of RWD;

The product fails to be used correctly according to the user manual.

Contents

1-Introduction

First of all, thank you for choosing DSC-400 Single cell suspension dissociator made by RWD!

Please be sure to carefully read all the randomly distributed information before installing and using this product for the first time, which will help you use the product better.

RWD Life Science Co., Ltd. is committed to continuously improving product functions and service quality, and reserves the right to make changes to any product described in this manual and the content of this manual without prior notice.

For the latest product information, please contact us by telephone or mail, or visit our website (www.rwdstco.com). Please contact RWD if you find any inconsistency between the actual product and the information contained herein during the use of the device, or you have any questions or suggestions.

- Single cell suspension dissociator Model: DSC-400

1.1 Product Overview

The Single cell suspension dissociator is an automatic tissue processing instrument designed, developed and produced by Shenzhen RWD Life Science Co., Ltd. and it is mainly used by researchers, hospitals and third-party testing organizations. It meets the needs of animal tissue processing in the field of animal cell and molecular biology research by providing the function of processing animal tissue blocks into single-cell suspension or homogenate. The prepared single cell suspensions are often used in experiments such as flow analysis, single cell sequencing or primary cell culture. The preparation of homogenate is a necessary step for nucleic acid or protein extraction, and the isolated protein can be used for immunoblotting, ELISA and other experiments, while the nucleic acid can be used for PCR amplification, and real-time fluorescence quantitative PCR assay.

To avoid injury to the experimenter and damage to the device, please read the section “2-Important information and security” carefully. If you have any questions or suggestions on safety, please contact us for after-sales service support.

The device should be operated and managed by trained professionals!

1.2 Product Features

- Dual-use machine enables applying different reagent supplies and procedures to process tissue into single cell suspensions or homogenates;
- Independent operation of multiple channels improves operational efficiency;
- User-friendly programming allows the user to invoke default programs or user programs;

- Operation safety ensures that the single cell tube is not loosened or leaked during operation, and the top components can be disassembled and cleaned.

1.3 Application Conditions

Please prepare the device operating environment under the conditions listed in the table below to ensure the operation and safety of the system.

Operating conditions	Temperature: 4-35°C (without heater) 4-30°C (with heater)
	Humidity: 10-80% RH (non-condensing)
	Work in a moist and hot environment: ≤35°C 80% RH (non-condensing)
Storage conditions	Temperature: -20-70°C
	Storage in a moist and hot environment: ≤70°C 93% RH (non-condensing)
Working power supply	100-240 V AC, 50-60 Hz
Altitude	<2000 m
Others	Keep out of sunlight and rain; prevent severe vibration

1.4 Product Parameters

Device size (L×W×H)	380×215×190 mm
Device weight	9 kg
Display	7" touch screen
Suitable sample weight	20 mg-4000 mg
Suitable buffer	0.3 ml-10 ml
Rotational speed	20-4000 rpm
Rotational direction	Clockwise or counterclockwise
Acceleration	≤100 r/s^2
Torque	≤0.15 N.m (at 200-4000 rpm)
Number of channels	4
Maximum number of user programs	200
Noise	≤85 dB

1.5 Components

Accessories	Delivery	Quantity	Purpose
4-channel dissociator	Standard	1	Preparation of single cell suspensions and homogenates
Power cord	Standard	1	Plug-in power cords for device power input, for different countries
Single cell tube	Standard	25/pack	For holding sample tissue and processed single cell suspensions or homogenates
Enzyme kit	Optional	1	/
User manual	Standard	1	Device operation instruction

2-Important information and security

Before using the device, please first read this chapter carefully and follow all safety instructions in this manual to prevent injury to the lab personnel or damage to the device.

2.1 Safety Symbols

Identification	Descriptions
	High temperature warning: Caution! High temperature!
	Protective grounding
	Biological risk
	Please consult the manual
	Beware of mechanical injury, do not touch
	Danger! High Voltage!

2.2 Safety classification

Electric shock protection grade: I
Waterproof and dustproof grade: IPX0

2.3 General Safety

1) Electrical safety. The applicable electrical safety standard for this device is IEC61010-1.
2) The device should be placed in a stable, safe and well ventilated conditions, and should be protected from excessive dust, vibration, strong magnetic field, direct sunlight, ventilation, excessive humidity or huge temperature fluctuations. The device should be kept at least 20 cm away from the wall to ensure unblocked ventilation during operation.
3) The device is only allowed to be used by trained professionals and operated within the applicable range. Do not use unauthorized accessories or attachments to operate the device. Non-conforming operation may lead to device damage and personal injury.

4) The altitude should not exceed 2000 m. RWD does not guarantee the device can work normally at places above 2000 m.
5) Avoid any liquid leaking into the device.
6) Do not operate the device with damaged components.
7) Do not operate the device while the bushings, single cell tubes, shields, and cleaning tanks are removed.

2.4 Electrical safety

To ensure safely, the following regulations need to be followed:

1) The device must use a matching power supply. If you are not sure of the type of power supply provided, please consult an authoritative power supplier or local power company.
2) Use grounding socket to power this device and ensure the ground wire is connected. Failed to connect to the ground wire may lead to electric shock.
3) To reduce the electromagnetic coupling effect between this device and other device in the laboratory, please use the power cord supplied with this device. Use of any other type of power cord is prohibited.
4) Whenever discovered potentially unsafe operation, turn off and unplug the equipment from the main power supply.
5) Do not open the enclosure without authorization as this may result in electric shock and damage the device.
6) This device is for indoor use only and should not be exposed to rain or wet conditions. If liquid comes into contact with any part of the device circuit, please immediately turn off the power and unplug it; dry the wet part of the device promptly.
7) Ensure that the operating table is dry during the process.
8) When moving the device from a cold environment to a room temperature environment, condensed liquid droplets may damage the device. Please wait until the device is dehumidified before operating.

2.5 Chemical and Biological Safety

1) Experimenter should strictly comply with laboratory safety precautions, and wear protective gloves and protective glasses.
2) When handling hazardous or unknown samples, operate the device in a safety hood for experimenters ' safety.
3) Before preparing tissue homogenates or single cell suspensions with organic solvents or caustic substances, be sure to test them for suitability for device components and single cell tubes.
4) When the device components are contaminated, no one other than the experimenter should have access to the device.

3-Product Structure and Interface

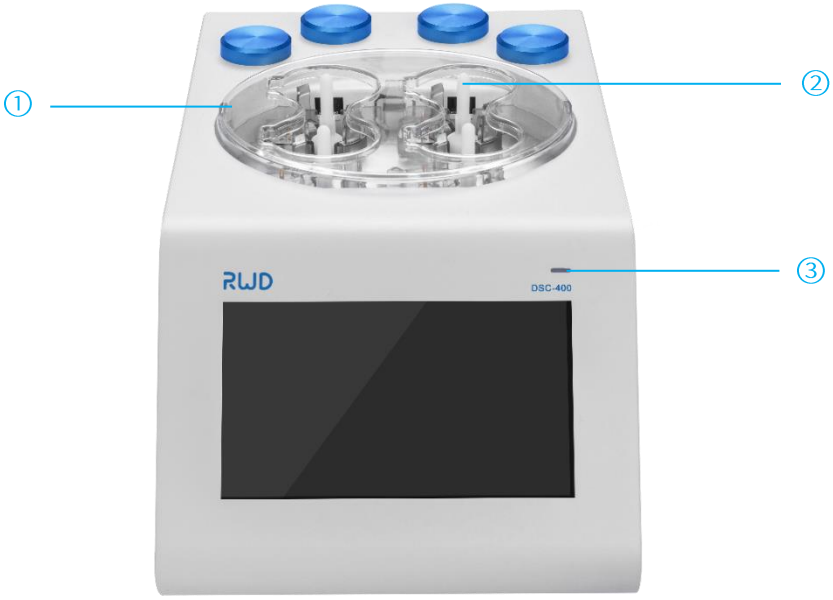


Figure 3-1

Figure 3-2

No.	Name	Quantity	Function
①	Shield	1	To protect the safety of the experimenter
②	Bushing	4	Connect channels
③	Indicator light	1	To indicate the power-on status
④	Channel	4	Interface for processing tissue consumables
⑤	USB-A port	1	Copy of user data
⑥	USB-B port	1	Software upgrade
⑦	Power switch	1	Power on/off the device
⑧	Power interface	1	Connect the power supply

4-Product Assembly

1) Open the packing case and take out the device and accessories.
2) Place the device on a stable operating table and remove the foam packaging.
3) Insert the white bushing into the channel connector of the device, as shown in Figure 4-1.

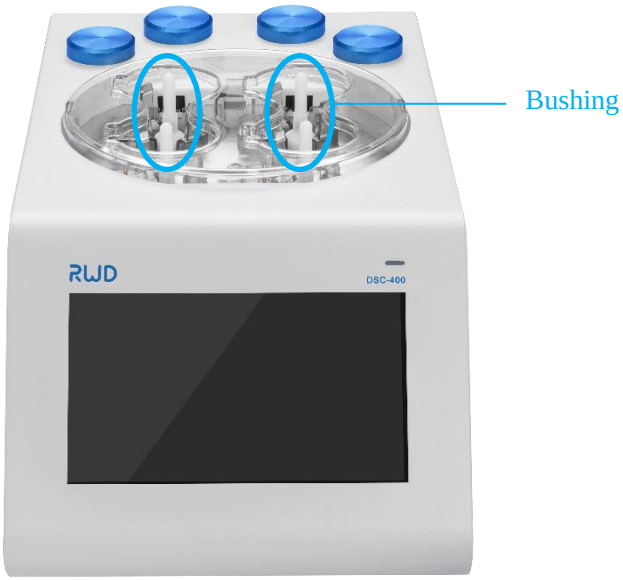


Figure 4-1

4) Connect the device to the power cord and turn on the power switch to start the device.

5-Operation Guide

5.1 Preparation

1) Add the corresponding tissue lysate or enzyme to the single cell tube according to the kit instructions to mix it.
2) Cut the target tissue sample into small pieces and transfer to the single cell tube. **Be sure to tighten the cover of the single cell tube.**
3) Turn the single cell tubes upside down and load into the device channel, as shown in Figure 5-1. The 4 channels are independent of each other and can process different samples at the same time.

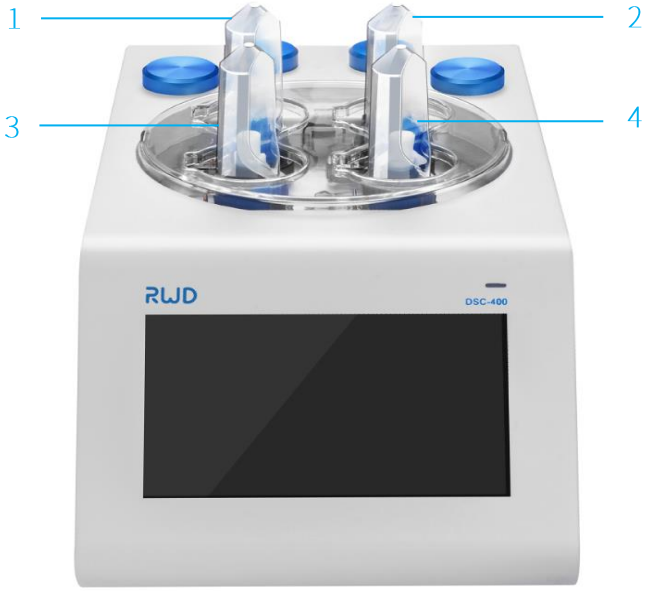


Figure 5-1

5.2 Start

Turn on the power switch on the rear panel of the device and enter [Home], as shown in Figure 5-2. When the single cell tube is installed into channels 1, 2 and 3, the channel is in the state of “Installed”, as shown in Figure 5-2 for channels 1, 2 and 3. When channel 4 is not installed with a single cell tube, the channel is in the state of “Free”, as shown in Figure 5-2 for channel 4.

Figure 5-2

Name	Description
Setting	Click to enter the [Setting] interface, see **5.6 Se**
User program	User programs, up to 200
Default program	Factory common setups
Delete	Click to delete the user program
Edit	Click to enter the [Edit Program] interface
<	User program or default program page turning
>	User program or default program page turning
Clear	Click to clear the program invoked by the selected channel
Invoke	Click to assign the selected program to the selected channel
Run	Click to run the selected channel

Click on a channel to select/cancel it. As shown in Figure 5-3, click on the channel to cancel it when there is no need to operate on channel 3. Click on the channel to reselect it when it is necessary to invoke the program on channel 3.

Figure 5-3

5.3 Invoke Program

Click to select [User program] or [Default program] to be invoked on [Home], click Invoke and the selected program will be assigned to the selected channel, as shown in Figure 5-4. Both channels 1 and 2 invoke programs, channel 3 is unselected and channel 4 is “Free”.

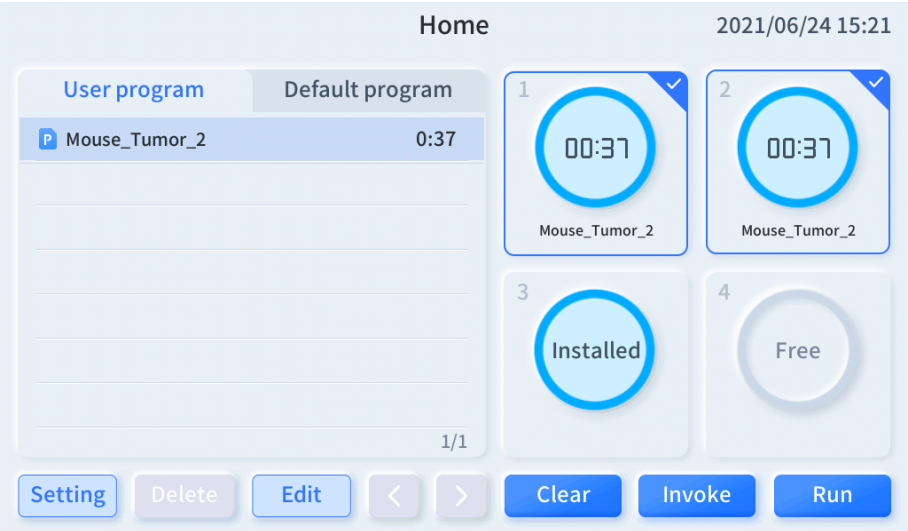


Figure 5-4

Select the channel and click Clear to clear the program invoked by the selected channel, and the channel status will change to “Installed”, such as Channel 2 in Figure 5-5. The channel can also reselect the program to replace the cleared program.

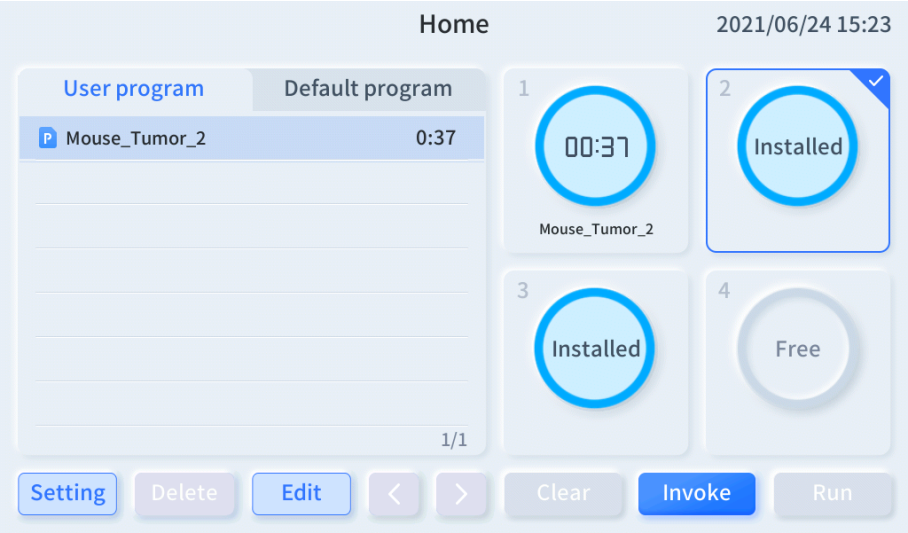


Figure 5-5

5.4 Run Program

Select the channel and click Run. The channel will run the invoked program and enter the running state, such as channels 1 and 2 as shown in Figure 5-6.

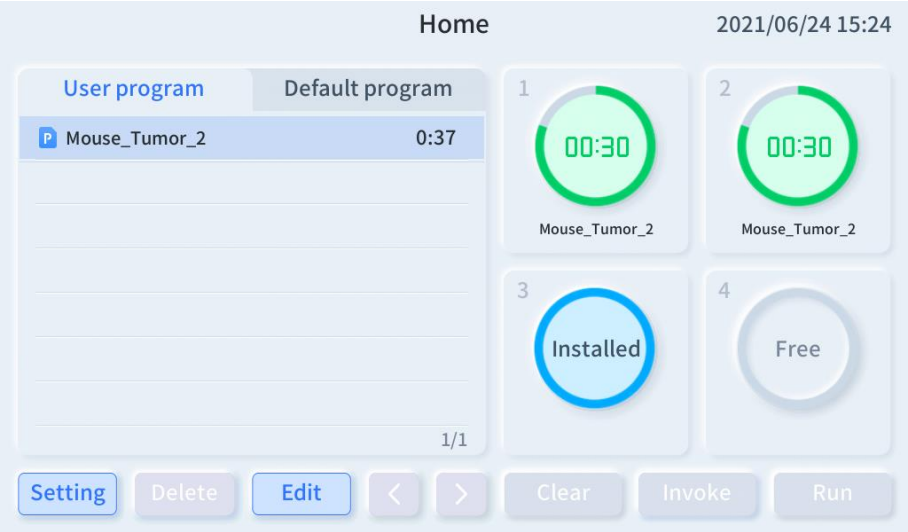


Figure 5-6

Click the channel in running state to pause or end the channel running, as shown in Figure 5-7.

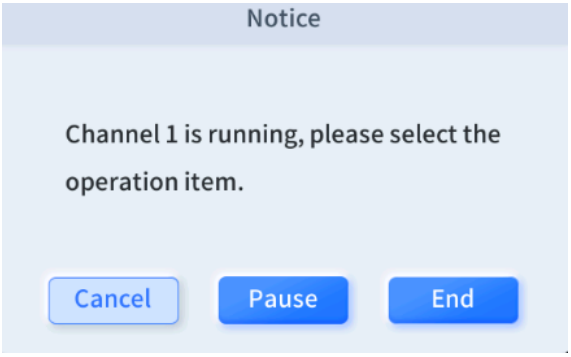


Figure 5-7

Click Pause to pause the running channel, and Channel 1 is “Paused”, as shown in Figure 5-8. Click Run again to continue running the channel.

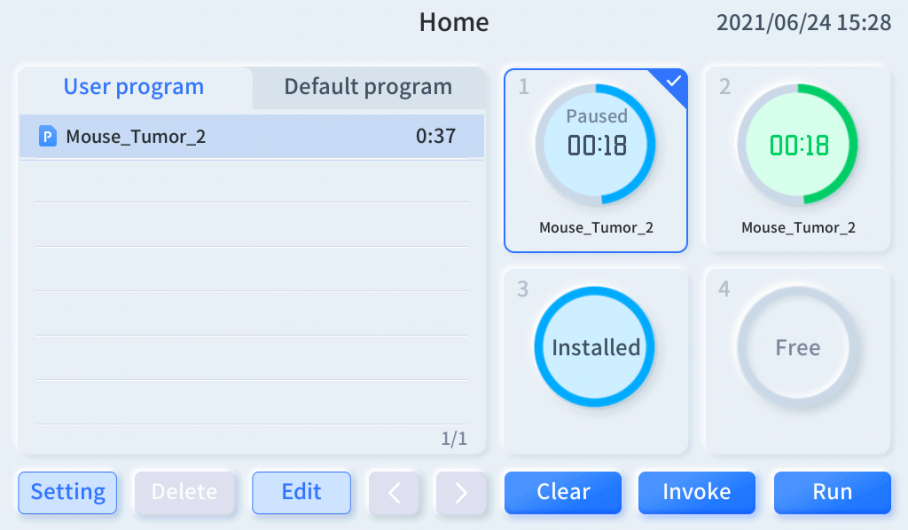


Figure 5-8

Click End to manually end the program, and Channel 1 is “Ended”, as shown in Figure 5-9. Click Run again to restart the channel.

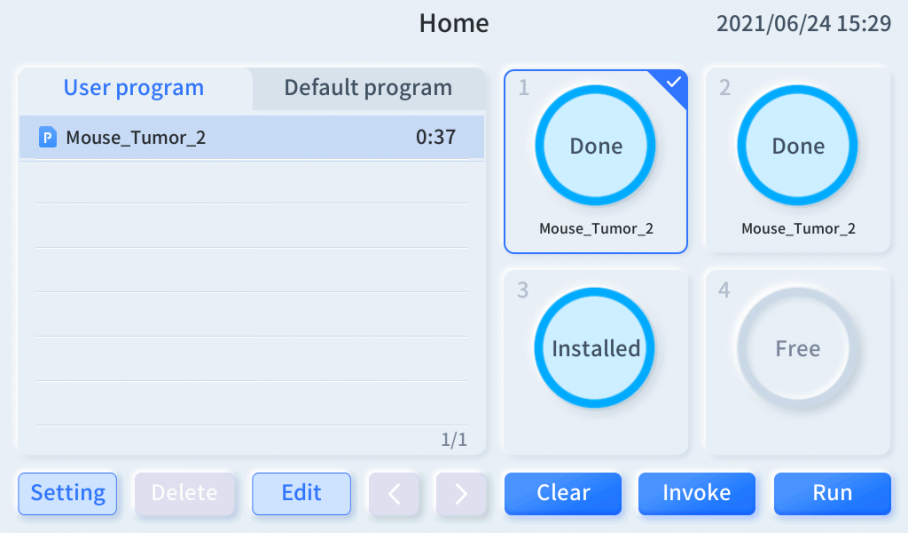


Figure 5-9

At the end of the channel run, its status changes to “Ended”, as shown in Figure 5-9.

5.5 Edit Program

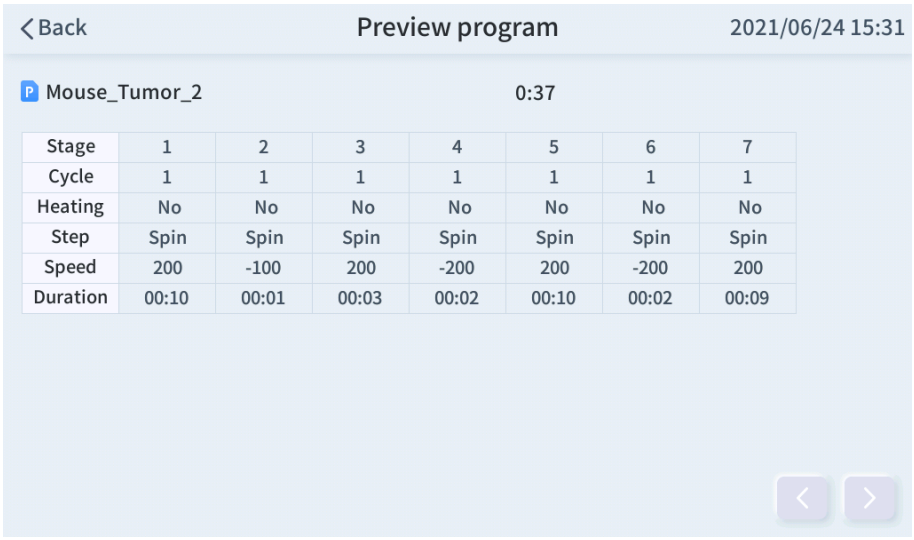
Click a program in [User Program] or [Default Program] and click Edit to enter the [Edit program] interface, as shown in Figure 5-10.

Figure 5-10

Click Save to save the current user program. If the current program is a default program, the button is not available and the default program cannot be modified.

Click Save as to save as a user program.

Click Preview to preview the current program and enter the [Preview program] interface, as shown in Figure 5-11.



Stage	1	2	3	4	5	6	7
Cycle	1	1	1	1	1	1	1
Heating	No	No	No	No	No	No	No
Step	Spin	Spin	Spin	Spin	Spin	Spin	Spin
Speed	200	-100	200	-200	200	-200	200
Duration	00:10	00:01	00:03	00:02	00:10	00:02	00:09

Figure 5-11

1) Step

Click to select [Step], as shown in Figure 5-12.

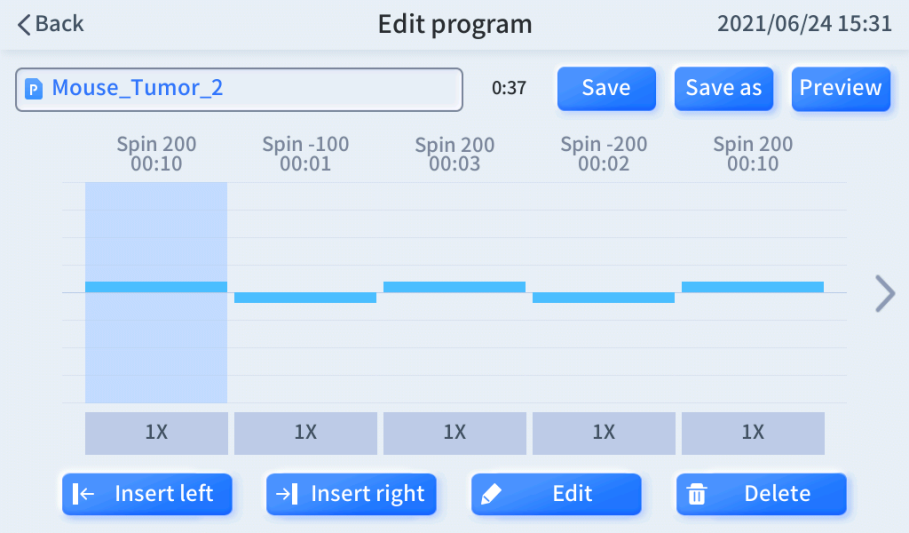


Figure 5-12

Click Insert left / Insert right to add a new step to the left/right of the selected step, as shown in Figure 5-13. Edit the step type, speed, duration and direction of the new step in the [Add new step] interface.

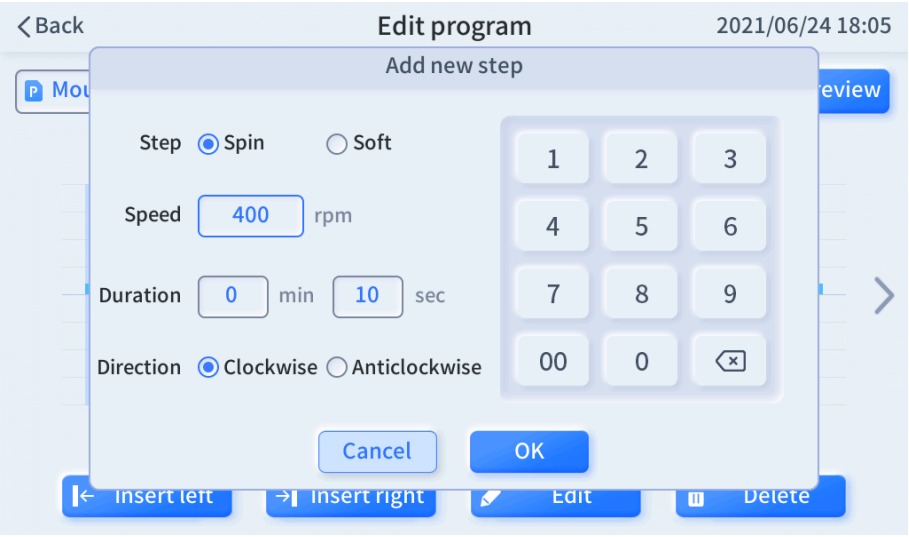


Figure 5-13

Click Edit in the [Edit program] interface as shown in Picture 5-12 to edit the step type, speed, duration and direction of the currently selected step.

Click Delete in the [Edit program] interface as shown in Picture 5-12 to delete the currently selected step.

2) Stage

Click to select [Stage], as shown in Figure 5-14.

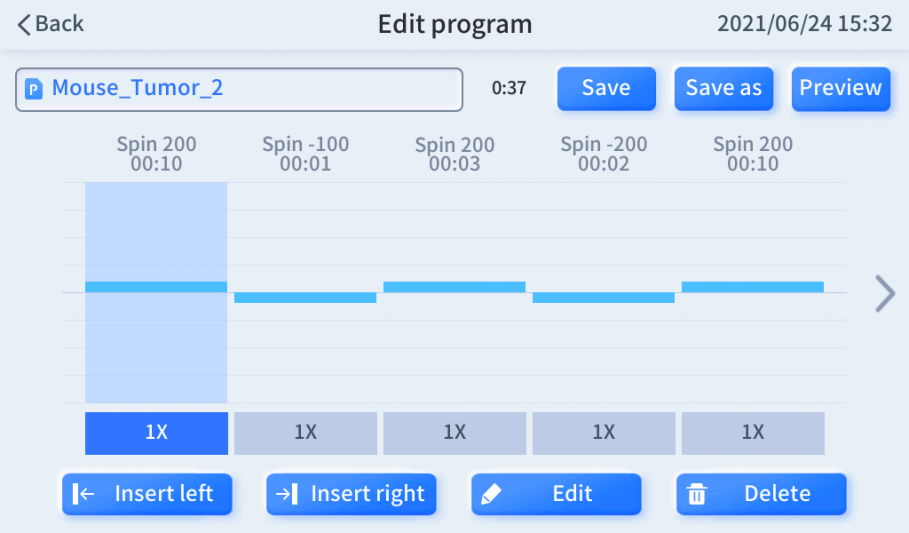


Figure 5-14

Click Insert left / Insert right to add a stage to the left/right of the selected stage, as shown in Figure 5-15. Edit the cycle time for the new stage and choose whether to heat it or not in the [Add new stage] interface. The cycle times range from 1 to 10.

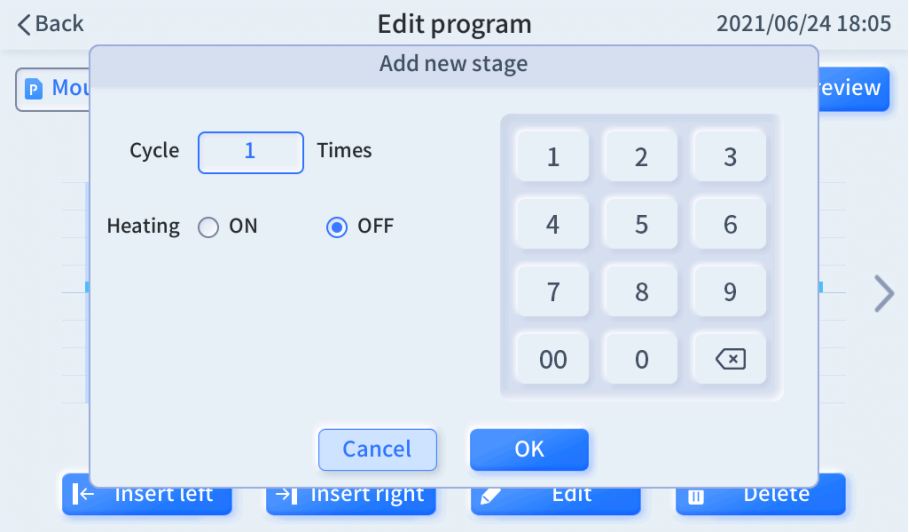


Figure 5-15

Click Edit in the [Edit program] interface as shown in Picture 5-14 to edit the cycle time of the currently selected stage and whether to heat it or not.

Click Delete in the [Edit Program] interface as shown in Picture 5-14 to delete the currently selected stage.

5.6 Setting

Click Setting on [Home] to enter the [Setting] interface, as shown in Figure 5-16.

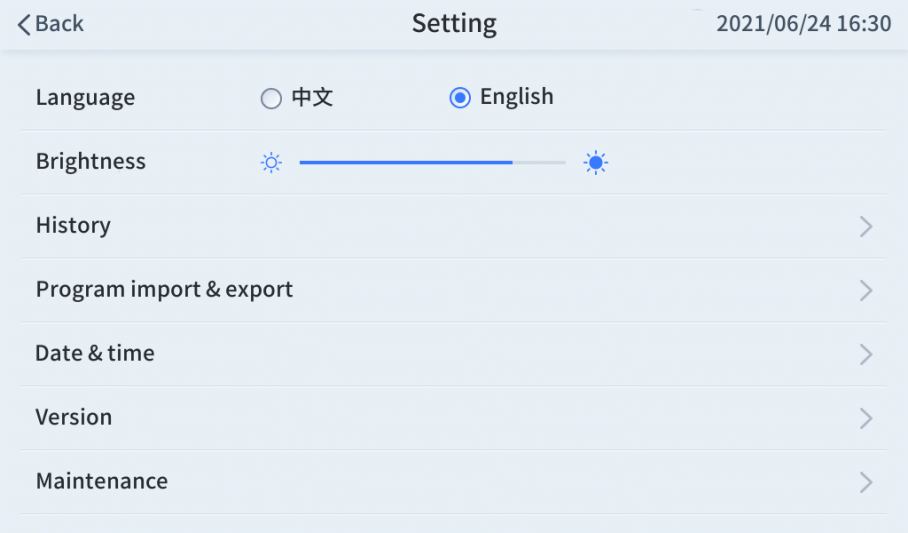


Figure 5-16

Name	**Function**
Language	Switch language to Chinese or English
Brightness	Adjust display brightness
History	Click to view the history, see **5.6.1 History**
Program import and export	Click for program import and export, see **5.6.2 Program Import and Export**
Date and time	Click to set date and time, see **5.6.3 Date and** Time
Version	Click to view the information of the system version, see **5.6.4 Version**
Manufacturer maintenance	Only available to RWD after-sales personnel

5.6.1 History

Figure 5-17

The history is shown in green to indicate that the program running is not ended. The history is shown in red to indicate that the program is ended manually or abnormally.

Click one of the history records to view it and enter the [View the program history] interface, as shown in Figure 5-18.

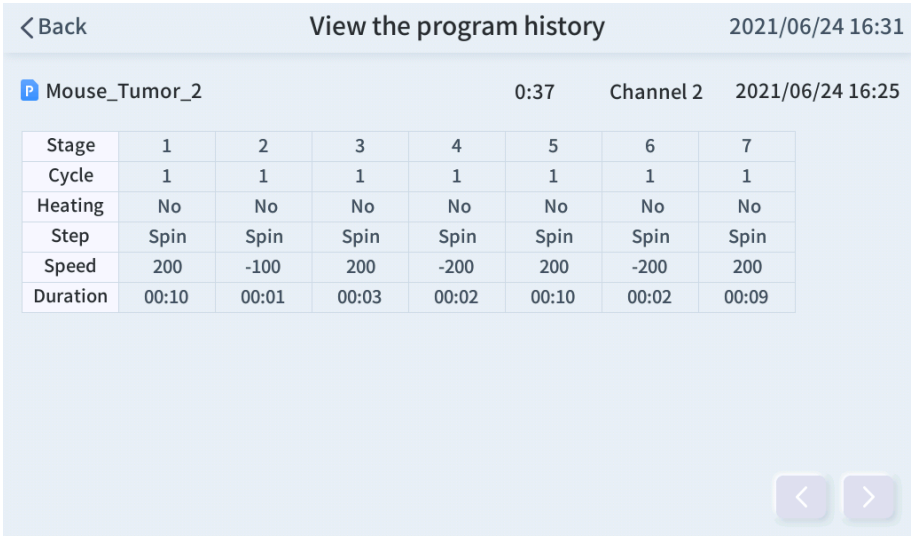


Figure 5-18

5.6.2 Program Import and Export

Connect a USB to the USB-A port to import and export programs.

Figure 5-19

Figure 5-20

5.6.3 Date and Time

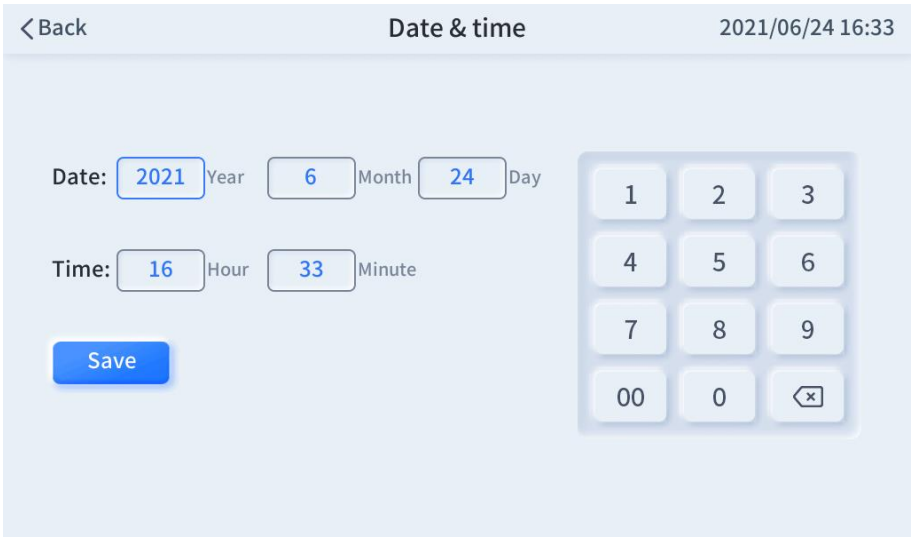


Figure 5-21

5.6.4 Version

Figure 5-22

6-Alarms

In case of malfunction of the device, it will display the alarm message and sound the alarm at the same time, as shown in Figure 6-1.

Click the icon  to sound off, and click  to close the alarm floating window and sound off.

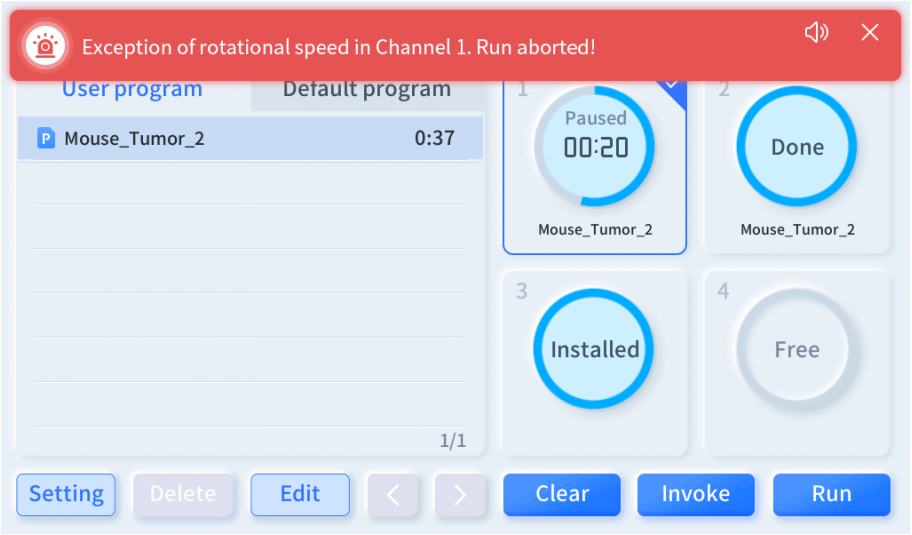


Figure 6-1

Alarm message	**Possible cause**	**Solutions**
Exception of rotational speed in Channel #. Run aborted!	Too large sample tissue mass	1) Check whether the single cell tube is blocked by the sample tissue, if so, remove the blocked tissue, reinstall the single cell tube and continue to operate; 2) Replace the single cell tube, reduce the sample tissue masses and rerun the channel
Exception of heater in Channel # . The heating stage cannot run normally!	The Heater is not installed in place	Please invoke the program that turns off the heating
Exception of driver board in Channels #. Recommend to restart! //vbus Please contact technical support if this exception persists after restart.	/	1) Disconnect the power cord and restart the device; 2) Contact RWD after-sales personnel
Exception of driver board communication in Channels A & B. Recommend to restart! Please contact technical support if this exception persists after restart.	/	1) Disconnect the power cord and restart the device; 2) Contact RWD after-sales personnel

Exception of driver in Channel #. Recommend to restart! //overcurrent Please contact technical support if this exception persists after restart.	/	1) Disconnect the power cord and restart the device 2) Contact RWD after-sales personnel
Exception of single cell tube installation in Channel # or a sensor exception!	The Single cell tube is not installed in place	1) Ensure proper installation of the single cell tube; 2) Disconnect the power cord and restart the device; 3) Contact RWD after-sales personnel
Audio alarm	Abnormal display	1) Disconnect the power cord and restart the device; 2) Contact RWD after-sales personnel

7-Maintenance

7.1 Cleaning and Maintenance

1) Remove the single cell tube when the device is not in use.
2) This device should be placed firmly and horizontally; Please avoid vibration or collision during movement.
3) Do not place heavy objects on the device.
4) Do not knock hard or scratch the device with sharp objects.
5) If any liquid overflows after the use of the device, please wipe it with a dry cloth.
6) It is important to follow the necessary safety precautions when cleaning and disinfecting the device.
7) It is recommended to disinfect the device with a wet cloth soaked in 70% ethanol or 1% hypochlorite solution.
8) It is recommended to clean the device with a wet cloth soaked in household detergent or 70% ethanol. Do not soak the device in a solution. Do not use acetone or corrosive liquids or aerosol cleaners for cleaning.
9) The shield and cleaning tank on the top of the device are removable for cleaning and disinfection, while other components are not removable.
10) The cleaning tank will automatically collect a large amount of overflowing liquid. Before removing the tank for cleaning and disinfection, please draw out the liquid with a pipette.
11) Do not remove components with any tools during cleaning. When removing and reinstalling components, check whether the components are working properly.
    - Unplug the power cord before cleaning the device.
    - Lift the shield upward to remove it, as shown in Figure 7-1.

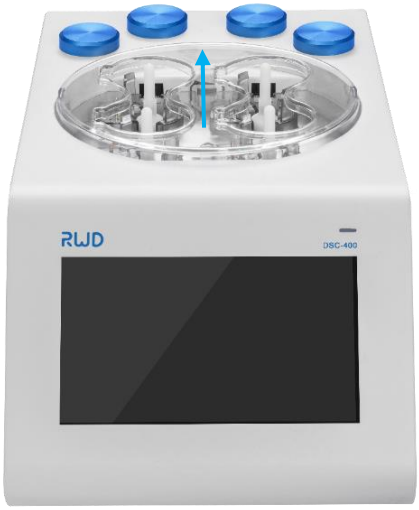


Figure 7-1

- Remove the bushing.
- Gently press the two buckles shown in Figure 7-2 toward the middle with both hands to remove the cleaning tank.

Figure 7-2

- Wipe device surfaces and other components with a wet cloth soaked in household detergent or 70% ethanol.
- Wipe device surfaces and other components for a second time with a wet cloth soaked in distilled water.
- An alkaline cleaner is recommended for cleaning removed shields, bushings and cleaning tanks.
- If the bushing or the cleaning tank is found damaged, replace them.
- Reinstall the cleaning tank, bushings, and shields. Firstly, align the holes and numbers as shown in Figure 7-3 to install the cleaning tank; secondly, install the bushings, and finally, align the buckles as shown in Figure 7-4 to install the shield. When components are installed correctly, there will be a slight clicking sound.

Figure 7-3

Figure 7-4

7.2 Repair

Do not open the enclosure to repair the device by yourself, otherwise it may lead to mechanical injury and electric shock. If you need to test or repair the device, please contact RWD after-sales personnel. Please sterilize the device and all components before returning the device in its original packaging.

8-Waste disposal

Dispose of single cell tubes and waste liquids in strict accordance with local waste disposal policies and regulations, and disinfection is required before disposal.

9-Warranty

The warranty for this system starts from the day when it leaves the factory. RWD provides after-sales support such as device maintenance and parts replacement in case of the device failure due to defects in materials or process during the warranty period.

Any device damage caused by incorrect use or out-of-range use is out of the scope of the warranty, and in case of any need for repairs or parts replacement, the costs incurred should be borne by the user.

If the device returned for repair is found to have been disassembled without authorization of RWD upon arrival, RWD will not provide after-sales services such as quality warranty, free maintenance and parts replacement.

The warranty statement (including its limitations) is issued exclusively by RWD and covers all other warranty conditions.

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www.dia-m.ru

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Тел.: +7 (495) 745-05-08 (многоканальный), +7 (383) 328-00-48
E-mail: service@dia-m.ru
www.dia-m.ru

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E-mail: service@dia-m.ru
www.dia-m.ru