
2800 Series Portable Automatic Water Sampler

Operation and Maintenance Manual





Caution! Once you receive your sampler and it is unpacked. Place the unit in an upright position for at least four hours to allow the compressor oil to settle before applying power to the unit. Failure to do so can damage the unit and is not covered under warranty.



Notice: The Model 2800 is shipped in a customized shipping box, it is recommended that you keep these materials in the unlikely event the sampler needs to be returned to the factory for service.

The Spectra 2800 Series automatic water sampler represents the true next generation of water sampling technology. The 2800 series is a flexible unit that allows the user a wide range of operational modes. Before using the instrument, please read this operation manual carefully. While the 2800 series is designed for portable use, the unit makes an ideal dedicated sampler as well.

The manual provides information about the performance, operation, maintenance and repair of the sampler. Reading the manual will give you a better working knowledge of the options that are available to enhance the user experience. For your safety, please pay attention to the following safety precautions to avoid danger.

Precautions

To ensure the safe use of the 2800 Series products the following points must followed:

1. Before use, you should read the contents of each chapter of this manual carefully.
2. Installation, operation, maintenance and repair must be carried out by appropriately trained personnel that are familiar with proper use.
3. Before making any connections, you must make sure that the power supply, any control circuits for high voltage operation, and voltage circuits higher than normal voltage are turned off.

This Operation Manual is a general version and covers all models of the 2800 Series. Some functions may not be available for your specific model. **Based on the** configuration of the instrument.

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Bookmark not defined.

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1. 1.Introduction to the sampler

The Spectra Technologies 2800 Series portable automatic water samplers adopt embedded control technology and is a fully functional portable instrument. It is suitable for sampling under multiple scenarios such as surface water and pollution sources, and can be programmed for schedule based sampling, time proportional sampling, flow proportional sampling, level proportional sampling, rainfall sampling.

2. 2800 Series Features

1. 2.1 Features of the sampler

2. Multiple sampling methods: Schedule Based sampling, Time Proportional sampling, Flow Proportional sampling, Level Proportional sampling, Rainfall sampling.

3. Sampling and recording function: It can automatically store sampling record information, including sampling time, triggering method, sampling volume, sampling method, sampling times, and sampling success or failure. All records can be viewed page by page and quickly page by page.

4. Alarm recording function: It can automatically store alarm record information of the sampler, including alarm time and alarm information.

5. Rainfall recording function: When connected to the optional rain gauge, it can automatically record the time and rainfall information of the current rainfall event, as well as the rainfall in-

tensity information for 1hour and 24 hours.

6. Flow recording function: When connected to the flowmeter, the unit can automatically record instantaneous flow and cumulative flow at the set time interval.

7. Water sample refrigeration function: The sampler is equipped with a compressor-based refrigeration unit. The refrigerator has a built in air handling system and will refrigerate collected water samples at the user set temperature.

8. Heating function: A heating module is installed inside the refrigerator and at the sample and pump chamber to ensure the normal operation of the sampler at temperatures that are below freezing.

9. Temperature Control function: The sampler has a temperature control function. The display will display the temperature of the refrigerator and sample/pump chamber in real time and supports temperature adjustment and over-temperature alarm functions.

10. Ambient temperature sensing function: The sampler has an environmental temperature sensor, which can automatically select cooling and heating according to the ambient temperature to ensure that the sampler functions properly as ambient temperatures change.

11. Automatic purging function of suction tube: Before each sampling cycle, the suction tube will be rinse and blown down prior to the actual sample to prevent sample contamination. The

purging duration can be set by the user.

12. Suction tube automatic emptying function: any liquid that is left in the suction tube is automatically drained before and after sample to prevent deposition, blockage and freezing. The purging time can be set. The suction tube is equipped with a filter screen reduce blockage.

13. Measurement calibration function: The sampling duration, and corresponding sampling volume of the suction tube can be set.

14. Password function: A login password can be set to prevent unauthorized program modification and can set by the user. The password function can be enabled or disabled by the user.

15. Component test function: When the sampler is in a stopped mode the peristaltic pump and other components can be manually run to determine their working status.

16. External pump functions: The sampler supports an external pump function The start time of the external pump can be set to meet the requirements of the site where the suction lift of the peristaltic pump is insufficient.

17. Power-off program protection function: If the sampler is powered off and powered on again or a power failure occurs, the current program settings, system clock, and data records are not lost.

18. Date\ Clock function: The system time of the sampler can be set, including month, day, year, hour, minute, and second.

19. Analog input interface: The unit has 2 input channels (4-20) mA to allow connecting flow meters and liquid level meters.

20. System upgrade function: Supports system upgrade with TF card.

21. Pump tube life reminder function: The unit will automatically accumulate the usage time of the pump tube, and when the set duration time is reached, it will prompt to replace the pump tube.

22. Multiple power supply modes: It supports three power supply modes: 120 VAC (60Hz) U.S. three- plug, 12 VDC tin-plated (polarity marked) power cord, and vehicle power outlet plug (12 VDC).

23. 2.2 Main technical indicators of sampler

- 1. Number of Sample bottle:** 1 to 12
- 2. Sample bottle material:** Polycarbonate
- 3. Sample bottle capacity:** 7000mL
- 4. Display screen:** 7-inch color screen with English menus.
- 5. Timed sampling:** 24 time points and the time can be set
- 6. External pump delay:** (1 to 10000) second can be set, increment 1second
- 7. sampling interval:** (1 to 9999) min can be set, increment 1min
- 8. Single sampling volume:** (10 to 7000) mL can be set, increment 1 mL
- 9. Number of mixed collections:** 1 to 100
- 10. sampling amount error:** $\pm 5\%$

11. Equal-proportional sampling error: $\pm 5\%$
12. cooling mode: compressor-based cooling
13. Sample records: 5000
14. Alarm records: 2000
15. Traffic records: 2000
16. Rainfall records: 2000
17. Temperature control accuracy: $2\text{ }^{\circ}\text{C}$
18. Maximum horizontal lift: 80m
19. Maximum vertical lift: 8m
20. Pipeline air tightness: $\leq -0.085\text{MPa}$
21. Analog acquisition error: $\pm 0.04\text{mA}$
22. System clock timing error: $\leq 5\text{s}/24\text{h}$
23. Ambient temperature: $-30\text{ }^{\circ}\text{C}$ to $40\text{ }^{\circ}\text{C}$
24. Protection level: IP55
25. Insulation resistance: $>20\text{M}\Omega$
26. Mean continuous time between failures (MTBF): $\geq$

1440h/time

27. Rated power: $\leq 200\text{W}$ with all systems functioning
28. External dimensions: $25.42''$ (647mm) (L) $\times$ $15.7''$ (400mm) (W) $\times$ $17.36''$ (441mm) (H)
29. Weight: 44.1lbs. (20kg)

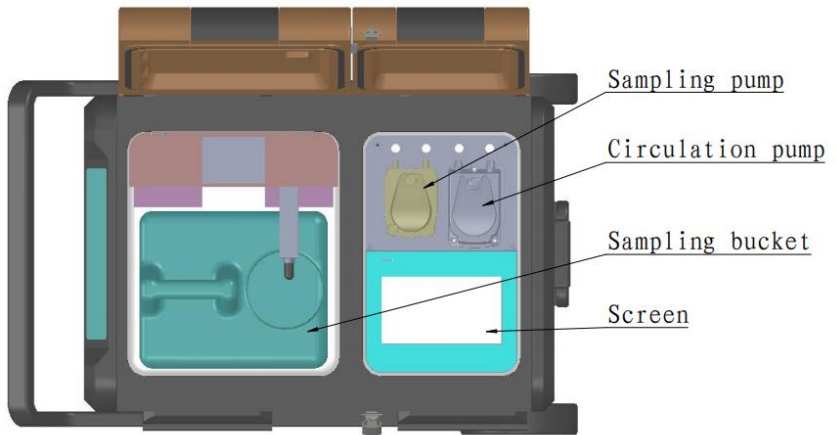
3. Sampler composition and waterway design

24. Sampler design

The sampler is composed of a control unit, sampling unit and water sample storage chamber.

The sampler is divided into two internal sections: the left side is the water sample chamber that holds the sample bottle.

The right is control unit, LED display and the pumps. To open the covers on both sides are shown in the following figure.



Note: The sampler is available in 2 models: The model 2800 without handle and wheels and the 2825 with wheels and handle. This is the only difference, all other functional capabilities are the same.

(1) The Control unit

The Control unit consists of the touch screen, mainboard, and drive board. The TF card slot is located in the upper left corner of the touch screen.

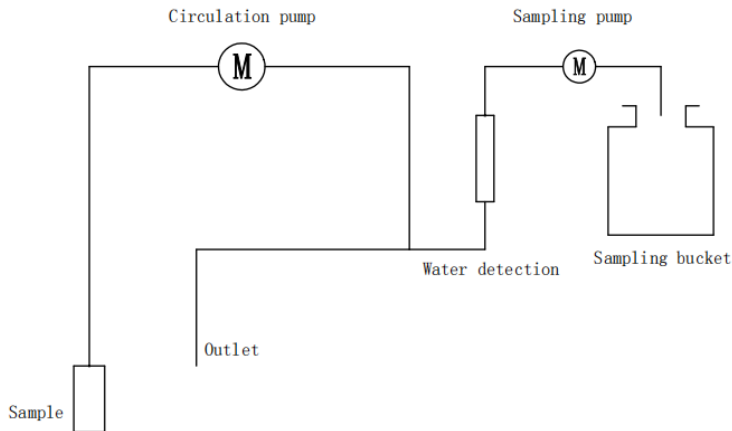
(2) Sample unit

The sampling unit consists of the circulating pump, sampling pump, and water detection sensor is located behind the Control unit. The water sample is extracted from the sampling point to the sampler through the operation of the peristaltic pump.

(3) Water sample cold storage unit

The water sample cold and heated storage chamber is supplied with a 7000 ml sample storage bottle. The design incorporates a compressor-based refrigeration system and proprietary heating system to maintain sample temperature. This design allows the sampler to operate under both high and freezing ambient temperatures. The sampler will use each system based on the ambient temperature and will automatically start heating when the temperatures are low.

25. Water Piping Configuration



The circulating pump extracts the water sample from the sampling point to the sampler, and then the water is discharged from the drainage outlet through the circulation pipeline. The sampling pump extracts a part of the water sample from the circulating pipeline branch and injects it into the sampling bottle.

The water flow test can detect whether there is a water sample passing through to determine whether the sampling is

successful.

Note: When the sampler is used in a extremely low-temperatures, it is recommend that the external suction tube of the sampler should be fitted with heat-tracing tape and insulation to prevent freezing.

4. Using the Sampler

26. Detailed Programming steps

27. 4.1.1 Start-up

After the sampler is turned on, the main screen is displayed, as shown in Figure 1.

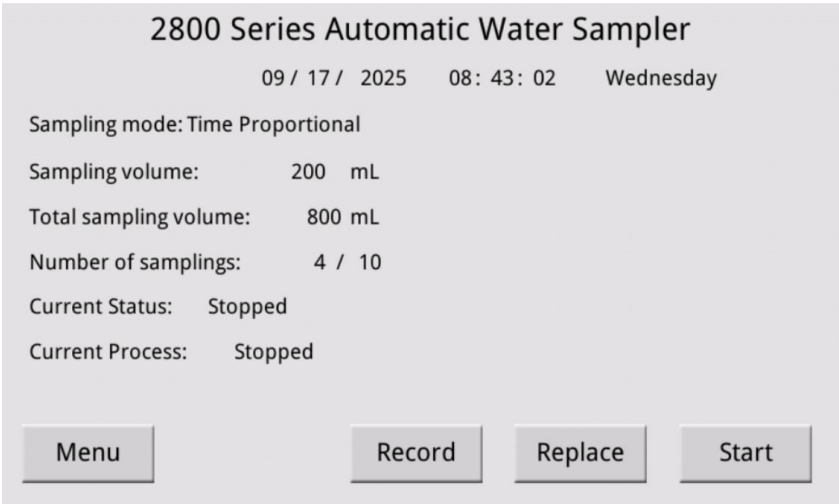


Figure 1

The main screen shows sampling parameters, function menus, recording, replacement (sampling bottle), and start buttons.

Click the "Replace" button to reset the sampling frequency and

total sampling amount.

28. 4.1.2 Log in

If login password is enabled the log in button will be displayed. Press the Login button in Figure 2 to open the login window. Enter the password (Default password: 0) Then click the "Enter" button to log in. as shown in Figure 2.

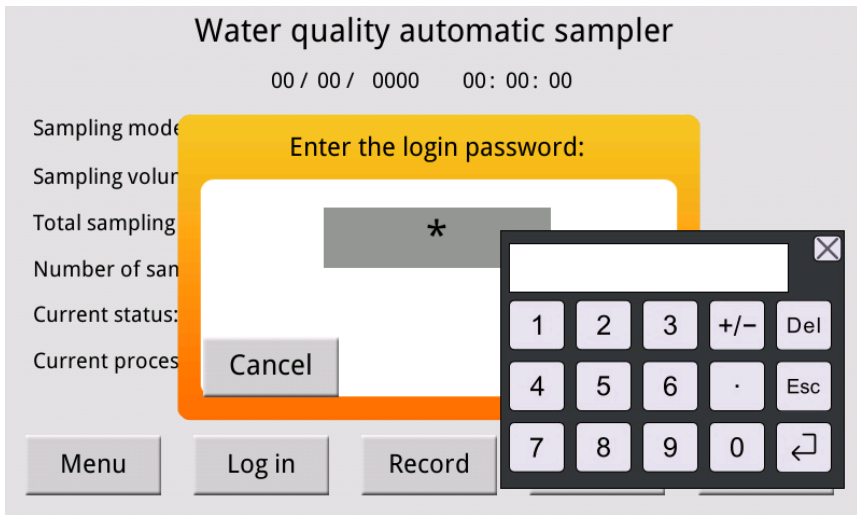


Figure 2

29. 4.1.3 Function menu

Once login is complete, click the "Menu" button to enter the Function Menu. as shown in figure 3.

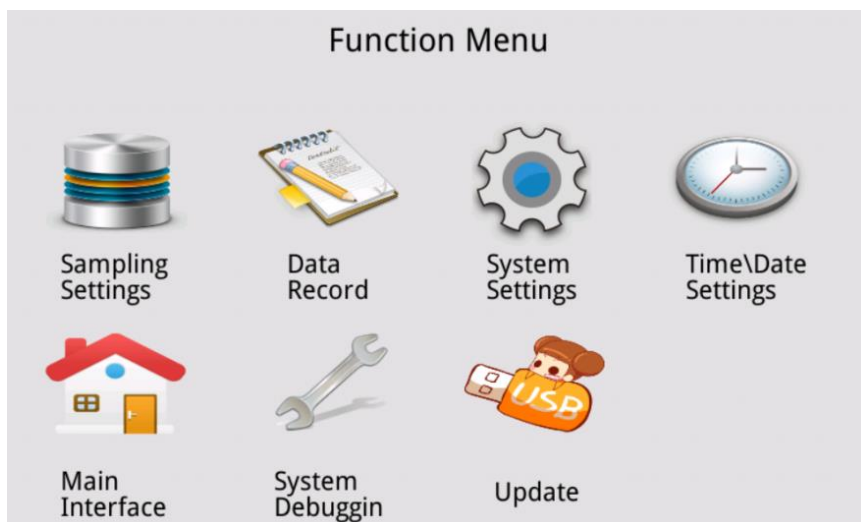


Figure 3

30. 4.1.4 Sampling Setting

After entering the Function Menu display, click the "Sampling Settings" button to enter the sampling setting interface, where you can select the sampling mode and set the sampling parameters, as shown in Figure 4.

Sampling settings

Sun ☐ Mon ☐ Tues ☐ Wed ☐ Thur ☐ Fri ☐ Sat ☐

Sampling mode: Schedule Based ▼ Setting All ☐

Sampling volume: 0 mL

Number of samples: 0 (0 to 100:"0" indicates continuous operation.)

External pump delay: 0 s

Current Status: Stopped

Current Process: Stopped

StartReturn

Insert

Figure 4

(1) The sampling mode is divided into Schedule Based, Time Proportional, Flow Proportional, Level Proportional and Rainfall sampling. After clicking "Sampling mode", you can select different sampling modes from the drop down with the downward arrow, as shown in Figure 5.

Sampling settings

Sun ☐
Mon ☐
Tues ☐
Wed ☐
Thur ☐
Fri ☐
Sat ☐

Sampling mode:

Schedule Based ▼

Setting

All ☐

Sampling volume:

Schedule Based

Number of samples:

Time Proportional

(indicates continuous operation.)

External pump delay:

Flow Proportional

Current Status: Stopped

Level Proportional

Current Process: Stopped

Rainfall sampling

Remote sampling

Start

Insert

Return

Figure 5

Mode Definitions:

Schedule Based: According to the schedule, the sampler collects a quantitative amount of water samples into the sampling bottle.

Time Proportional: According to the set sampling time interval, the sampler automatically collects quantitative water samples from the sampling point into the sample bottle.

Flow Proportional: Set the volume of the water sample flow interval in the flow ratio setting interface. For each water sample that flows through the set volume, the automatic water quality sampler will collect a quantitative water sample from the sampling point into the Sample bottle.

Level Proportional: Set the water sample liquid level height value on the liquid level ratio setting interface. If the liquid level exceeds the set liquid level height, the water quality automatic

sampler will collect a quantitative water sample from the sampling point into the Sample bottle.

Rainfall sampling: In conjunction with the rain gauge, set the rainfall trigger value on the rainfall setting interface. When the rainfall parameters reach the set parameters, the water quality automatic sampler will collect a quantitative water sample from the sampling point into the Sample bottle.

Insert: When the sampler is in standby mode, immediately perform a sampling once.

(2) When selecting the "Schedule Based" sampling mode, Click the "Setting" button, and the screen will enter the "Timer Schedule" interface. The "Timer Schedule" can set up to 24 timing points, as shown in Figure 6.

Timer Schedule

1:	☒	16	Hour	31	Minute	7:	☐	0	Hour	0	Minute
2:	☒	16	Hour	40	Minute	8:	☐	0	Hour	0	Minute
3:	☐	16	Hour	42	Minute	9:	☐	0	Hour	0	Minute
4:	☒	0	Hour	0	Minute	10:	☐	0	Hour	0	Minute
5:	☒	0	Hour	0	Minute	11:	☐	0	Hour	0	Minute
6:	☐	0	Hour	0	Minute	12:	☐	0	Hour	0	Minute

Page Down

Return

Timer Schedule

13: 0 Hour 0 Minute	19: 0 Hour 0 Minute
14: 0 Hour 0 Minute	20: 0 Hour 0 Minute
15: 0 Hour 0 Minute	21: 0 Hour 0 Minute
16: 0 Hour 0 Minute	22: 0 Hour 0 Minute
17: 0 Hour 0 Minute	23: 0 Hour 0 Minute
18: 0 Hour 0 Minute	24: 0 Hour 0 Minute

Figure 6

(3) At the top of the sampling settings interface, you can select the day of the week for sampling. After selecting it, the sampler will sample in the set sampling mode at the corresponding time.

If "All" is selected, sampling is performed every day.

For example, "Tuesday and Wednesday are selected, and the sampling mode is time proportional sampling, the sampling volume is 100mL, and the sampling times are 5" means that the sampler will sample in time proportional mode on Tuesday and Wednesday every week, with 100mL sampling each time and 5 sampling times per day, and no sampling at other times.

After setting the sampling mode and parameters, return to the main interface and click "Start" to start sampling.

Note: The sampling frequency can be set to "0-100". When the sampling frequency is set to 0, it means that there is no upper limit to the sampling frequency, and the sampler will continue to sample.

31. 4.1.5 System Debugging

After entering the function menu interface, click the "System Debugging" button to enter the system debugging interface, as shown in Figure 7.



Figure 7

Note: All system debugging has been completed before leaving the factory, and the sampler can be used directly without further debugging. If any problems occur, please contact our after-sales service directly.

(1) Click the "Component Testing" button to enter the component test interface, as shown in Figure 8. You can test whether each component is normal and observe the current status of each component.

Component Testing

Sampling pump:

foreward

reversal

External pump:

open

Circulation Pump:

foreward

reversal

Water flow detection:

Water leak detection:

Page Down

Return

Figure 8

After the first page is complete, click the "Page Down" button. The interface is displayed, as shown in Figure 9. You can select the Control status. In manual mode, you can manually Control the working status of the component.

Component Testing

Control Mode:

Automatic

Heat Trace Tape:

open

Pump Chamber Heating:

open

Page Up

Return

Figure 9

(2) Click the "Temperature Settings" button to enter the temperature control setting interface, as shown in Figure 10. This interface allows you to select whether to enable or disable temperature control, displaying the current temperature of the refrigerator and the upper and lower limits of temperature control.

Temperature Control Settings		
Temperature Control Mode:	Enable	
Refrigeration Temperature:	27	°C
Temperature Compensation:	0	°C
Alarm Upper Limit:	100	°C
Alarm Lower Limit:	-20	°C
Control Status:	Normal	
Page Down	Page Up	Status: 
		Return

Figure 10

Click the "Page Down" button, the interface is shown in Figure 11. The defrosting parameters can be set on this interface, and no alarm record will be generated during defrosting.

Pump Chamber Temperature		
Defrosting time:	0	min
Defrosting recovery:	0	min
Defrosting begins:	0 : 0	
Date:	1 - 1 - 2021	
Time:	0 : 35 : 17	
Page Down	Page Up	Return

Figure 11

Click the "Page Down" button, as shown in Figure 12.

This interface can set the start stop temperature, continuous working time, and rest time of the heat tracing belt, and also display the current temperature of the pump chamber.

Temperature Control Settings

Continuous Operation Time Limit:

120

min

Break Duration:

1

min

Heat-Tracing Tape Start-Up Temperature:

5

°C

Heat-Tracing Tape Cut-Off Temperature:

20

°C

Pump Chamber Temperature

32.6

°C

Pump Chamber Temperature Compensatio

0

°C

Page Down

Page Up

Return

Figure 12
Click the 'Page Down' button, as shown in Figure 13, where you can set the lower and upper limits of the ambient temperature, and set the upper and lower limits of the pump chamber.

Temperature Control Settings			
Environmental:			
Lower Limit:	10.0	°C	Temperature: 26.6 °C
Upper Limit:	50.0	°C	Mode: Standby
Refrigeration:	Cooling		Pump Chamber:
Upper Limit:	20	°C	Upper Limit: 50 °C
Temperature:	27	°C	Temperature: 32.6 °C
Lower Limit:	18	°C	Lower Limit: 20 °C
Page Down		Page Up	Return

Figure 13

The sampler automatically works Control components (cooling and heating) based on the ambient temperature and temperature control parameters to achieve precise temperature Control. The lower and upper limits of the ambient temperature are important.

1.The current ambient temperature is 35 °C, with a lower limit of 5 °C and an upper limit of 3°C. The system switches to cooling mode. The cooling system operates based on the upper and lower limits of the refrigerated container temperature and the upper/lower limits of the control unit temperature, while the heating system does not operate;

2. The current ambient temperature is $^{\circ}\text{C}$, with a lower limit set to 5°C and an upper limit set to 3°C . At this point, the system switches to heating mode. The heating system operates based on the upper and lower limits of the refrigerator temperature and the upper/lower limits of the control unit temperature, while the cooling system does not operate.

Note: When the temperature control is turned off, the refrigeration system does not work under any conditions.

(3) Click the "Suction/Pump Tube Calibration" button to enter the measurement calibration interface, where you can set the pipeline emptying time, pipeline flushing time, and calibration sampling amount, as shown in Figure 14.

The screenshot displays a software interface titled "Suction/Pump Tube Calibration". It contains three rows of input fields and buttons:

- Row 1: "Pipeline Drainage Duration:" followed by a numeric input field containing "15", a unit label "s", and a "Start" button.
- Row 2: "Pipeline Rinse Duration:" followed by a numeric input field containing "15", a unit label "s", and a "Start" button.
- Row 3: A numeric input field containing "90", a unit label "s", the text "Sampling", another numeric input field containing "515", a unit label "mL", and a "Start" button.

At the bottom right of the interface is a "Return" button.

Figure 14

Note: After the sampler is not used for a long time, the pump tube is replaced, and the sampling tube is replaced, these parameters need to be recalibrated. Regular calibration should also be carried out during use, and the calibration cycle depends on the usage situation.

(4) Click the " Password Setup" button to enter the password setting interface, where you can choose whether to enable the login password and set a new login password. After changing, the original password will become invalid, as shown in Figure 15.

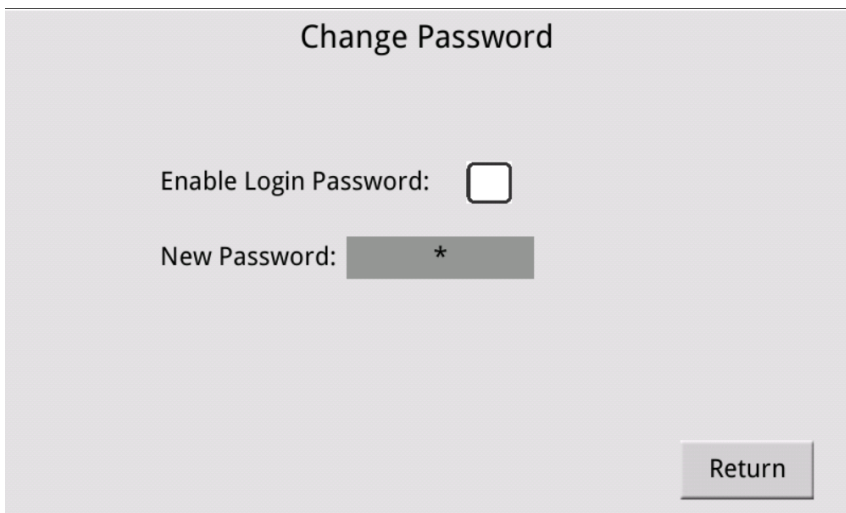
The image shows a 'Change Password' interface. At the top, the title 'Change Password' is centered. Below it, there is a label 'Enable Login Password:' followed by an unchecked checkbox. Underneath, there is a label 'New Password:' followed by a password input field containing a single asterisk '*'. In the bottom right corner, there is a 'Return' button.

Figure 15

Note: When you choose not to enable the login password, the sampler can be used directly after startup without logging in.

(5) Click the "Current Calibration" button to enter the current calibration interface, as shown in Figure 16.

Current Calibration				
Number: NO.1		Previous		Next
	AD Value	Current Value (mA)	Set Current	Measured
Min	590	4	4	0
Max	2956	20	20	0
Current	0	0		0
OK		Return		

Figure 16

This interface can perform 4mA to 20mA current calibration. After the calibration is complete, click the "Return" button to return to the system debugging interface.

32. 4.1.6 Data Record

After entering the function menu interface, click the "Data Record" button to enter the data record interface, as shown in Figure 17.

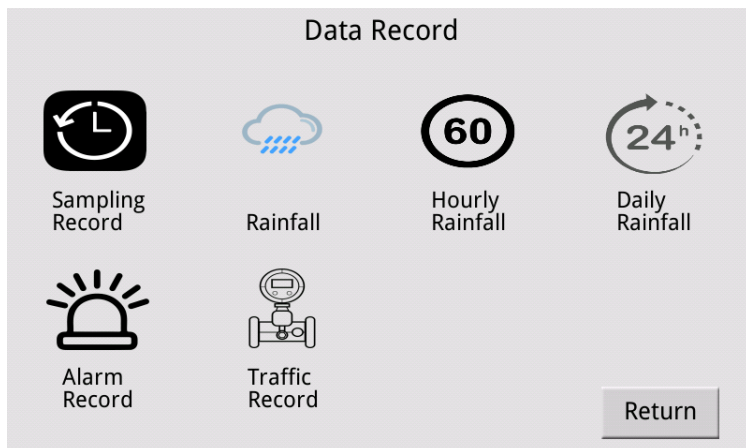


Figure 17

(1) Click the "Sampling Record" button to enter the sampling record interface, as shown in Figure 18, where you can view the sampling time, sampling mode, sampling volume, sampling results, sampling times, and total sampling volume.

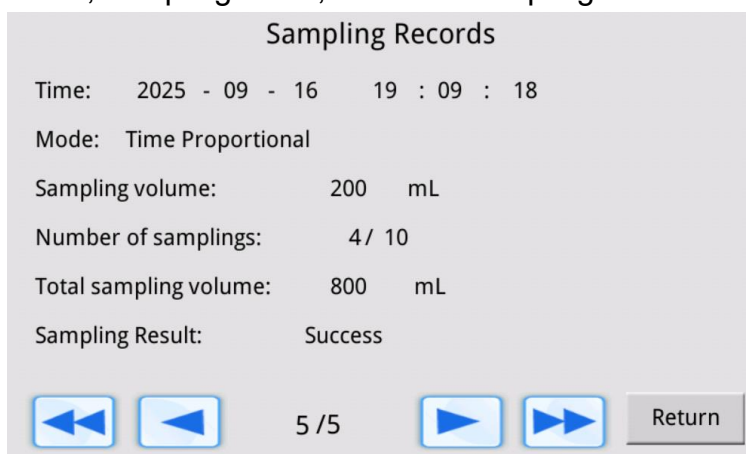


Figure 18

(2) Click the "Rainfall" button to enter the rainfall record interface, as shown in Figure 19, where you can view the rainfall

start time, end time, rainfall duration, rainfall level, and rainfall.

Rainfall records

Start time:

2025 - 9 - 16

10 : 38 : 15

End time:

2025 - 9 - 16

11 : 8 : 1

Duration of rainfall:

30

Minutes

Rainfall Grade:

Heavy Rain

Rainfall:

7.4

mm

3 / 3

Return

Figure 19

(3) Click the "Hourly rainfall" button to enter the hourly rainfall interface, as shown in Figure 20, where you can view the recorded time, cumulative rainfall in 1 hour, and rainfall level.

Hourly rainfall

Time:

2025 - 9 - 16

13 : 59 : 0

Rainfall:

0

mm

Rainfall Grade:

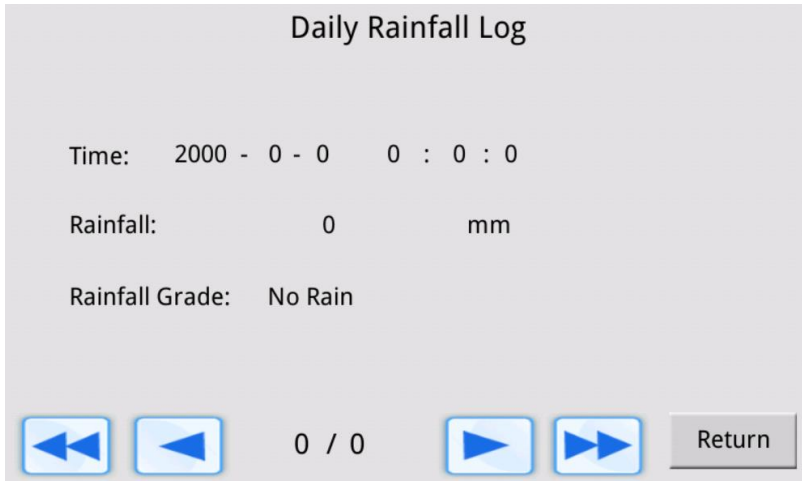
No Rain

6 / 7

Return

Figure 20

(4) Click the "Daily Rainfall" button to enter the daily rainfall interface, as shown in Figure 21, where you can view the recorded time, cumulative rainfall in one day, and rainfall level.



The image shows a user interface titled "Daily Rainfall Log". It displays three data points: "Time: 2000 - 0 - 0 0 : 0 : 0", "Rainfall: 0 mm", and "Rainfall Grade: No Rain". At the bottom, there are navigation controls including two left-pointing arrow buttons, the text "0 / 0", two right-pointing arrow buttons, and a "Return" button.

Daily Rainfall Log		
Time:	2000 - 0 - 0	0 : 0 : 0
Rainfall:	0	mm
Rainfall Grade:	No Rain	

Navigation: [Left Arrow] [Left Arrow] 0 / 0 [Right Arrow] [Right Arrow] [Return]

Figure 21

(5) Click the "Alarm Record" button to enter the alarm record interface, as shown in Figure 22, where you can view the alarm time and alarm type.

Alarm Log

Time: 2025 - 09 - 15 18 : 19 : 36

Alarm Type: Sampling Failed

  1 / 1   Return

Figure 22

(6) Click the "Traffic Record" button to enter the traffic record interface, as shown in Figure 23, where you can view the record time, instantaneous traffic, and cumulative traffic.

Flow Record

Time: 2025 - 09 - 17 08 : 43 : 22

Instantaneous flow:	0	m3/h
Totalized flow:	12	m3

  28 / 28   Return

Figure 23

33. 4.1.7 Clock calibration

After entering the function menu interface, click the "Time/Date Settings" button to enter the clock calibration interface. In this interface, you can calibrate the current date and time of the system, as shown in Figure 24.

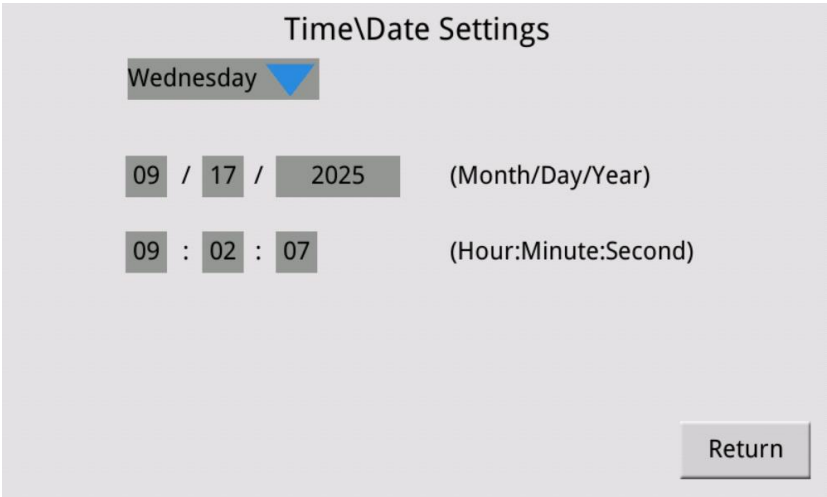


Figure 24

34. 4.1.8 System Settings

After entering the function menu interface, click the "System Settings" button to enter the system setting interface. In this interface, you can set the sampling motor speed and rainfall parameters, set whether to enable flow recording and flow recording interval, set the pump tube life and view the current remaining life of the pump tube, as shown in Figure 25.

System Settings			
Sample motor speed:	1600		
Rainfall Trigger Interval:	10	min	
Rainfall Stop Duration:	20	min	
Flow Record Enable:	☒	Totalized Flow:	12 m3
Flow Recording Interval:	10	min	
Tube Life:	500 h	Tube Remaining Life:	29978 min Replace
Return	Bottle Capacity:	7000 mL	Number of Bottles: 1

Figure 25

35. 4.1.9 System upgrade

After entering the function menu interface, click the "Update" button, and the system will prompt "Note: Please import the upgrade file to the root directory of the TF card and insert the TF card into the system TF card interface. The system will complete the upgrade after restarting! As shown in Figure 26.

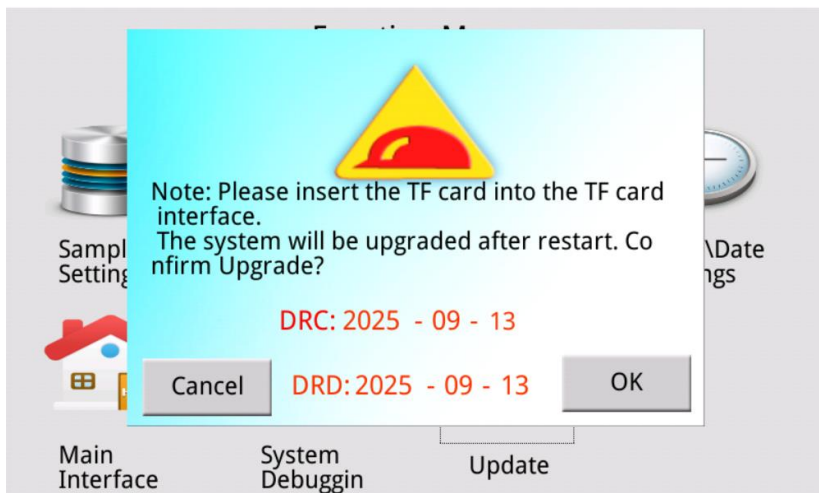


Figure 26

After inserting the TF card with the upgrade file into the TF card slot, click the "Confirm" button. After the upgrade is complete, restart the sampler to complete the system upgrade.

5. Sampler use and maintenance

36. Precautions

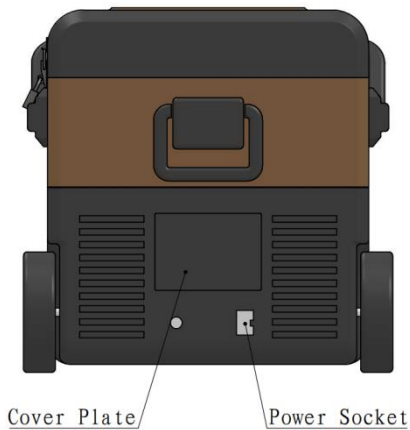
1. The sampler uses a compressor for cooling. After receiving the goods, the sampler should be placed on a flat ground for more than 6 hours before being powered on.
2. The sampler should be properly placed, and the angle between it and the ground should not exceed 30 degrees. During transportation or use, it should be avoided from severe vibration or collision to prevent damage.
3. The sampler works at 12 VDC. Do not connect any other AC/DC voltages.
4. The protection level of the sampler is IP55, and necessary

protection should be added when used in environments with rainfall or liquid droplets.

5. The sampler is equipped with a padlock, and each lock is equipped with 3 keys. Please keep it properly.

37. Introduction to the sampler interface

The pipeline and line interface of the sampler are located above the power socket, and can be seen by opening the cover plate, as shown in Figure 27.



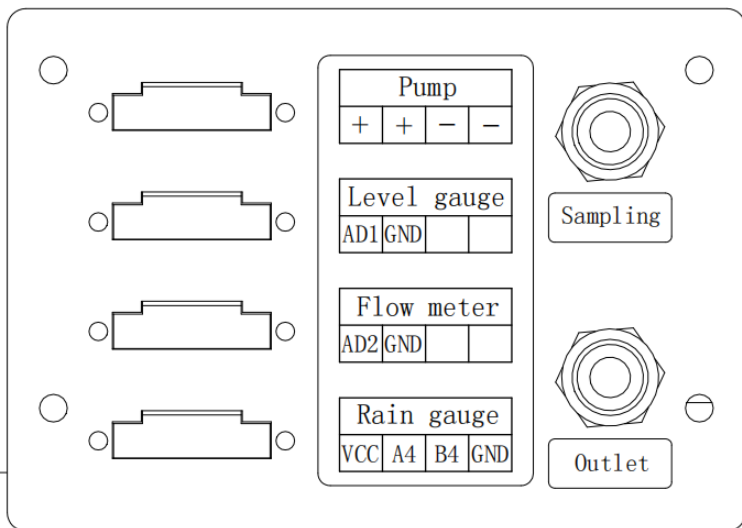


Figure 27

When connecting the lines and pipelines, please pay attention to the comparison to avoid wrong connections.

38. Maintaining the sampler

5.2.1 Discharge of condensate water

Regularly check the accumulation of condensate in the water sample refrigeration unit. There is a drain plug at the bottom of the refrigerator, which can be removed to drain the condensate. Pay attention to installing the drain plug after draining, otherwise it will affect the cooling effect of the sampler.

5.2.2 Replace the pump tube

The pump tube is a consumable and should be replaced regularly. The replacement cycle is related to the frequency of use of the sampler and the characteristics of the water sample. Generally, it is 2 to 5 months. (The cumulative working time of

the pump pipe is about 350 to 500 hours).

The sampler uses a precision peristaltic pump, and the pump tube used is a supporting component. Users are not allowed to use other pump tubes instead, otherwise the losses caused will be borne by the user!

Since the pump head and pump pipe are precision components, their installation requirements are extremely strict. When replacement is required, please follow the following steps A, B, C, D, E:



A. Make the pump tube in a straight line (without stretching deformation), cut the pump tube according to the specified length (The pump tube length of the circulating pump is 170mm, the pump tube length of the sampling pump is 154mm to 155mm), and ensure that the cut is flat and not skewed.



B. Remove the hand screw of the peristaltic pump, and remove the pump cover and hose.



C. Remove the joint from the old pipe, install it on the new pipe, and fasten it with a cable tie. Pay attention to the direction of the joint and cable tie to ensure that the pump pipe is not twisted during installation.



D. Clamp the hose joint on one side into the pump cover slot and press the hose clockwise to ensure that the joint is not higher than the pump cover.



E. Use a tool that does not damage the hose, place the hose in the middle position of the roller, and install the pump cover on the base by screwing the screws by hand. Check and ensure that the pump cover is assembled in place.

5.2.3 Defrost of refrigerator

Due to the low temperature of the sampler's constant temperature refrigerated box, local frost may occur after long-term use. Under normal circumstances, the sampler's built-in defrosting

function can be used. If the frost is severe, the power supply of the refrigerated box should be cut off, and it should be naturally melted before being powered on again.

6. Common faults and solutions of sampler

Common failure	Causes	Solution
No display after power-on	The power supply is not connected properly	Check the power interface to ensure that the connection is normal
Inaccurate sampling volume	The sampling volume error increases due to pump tube wear	Recalibrate the sampling amount
sampling failure	The sampling head is not completely immersed in the water surface, and air is drawn in	Reposition the sampling head to ensure it is completely submerged below the water surface

Warranty

Vortex Technologies Inc. warrants products of its own manufacturer to be free from defects in material and workmanship, when installed according to the instructions provided by Vortex Technologies, Inc. and used under normal conditions and service for a period of one year from the date of shipment, provided notice is given within the warranty period. Vortex Technologies will repair or replace at its option products found to be defective upon return to Vortex Technologies, Inc. Since Vortex Technologies has no control over the installation, use, or operating conditions of its equipment, all liability on the part of Vortex Technologies, Inc. is limited to the foregoing. Buyer, by supplying Vortex Technologies, Inc. with a valid purchase order or by acceptance of the product, agrees that Vortex Technologies, Inc. shall not be liable for special or consequential damages of any nature or for transportation, installation, adjustment or other expenses which may arise in connection to such product or part or use thereof.

Warranty Service

Direct all warranty and repair inquiries/request to Vortex Technologies, Inc., Service department. Phone (630) 466-9555. Before returning any products, please obtain a return materials authorization (RMA) number by contacting the service department. The designated RMA number should be noted on all shipping paperwork and marked on the outside of the return package.

To avoid processing delays, please be sure to include the following:

- 1) Company
- 2) Shipping and billing addresses
- 3) Contact Name and Phone number
- 4) Model and Serial numbers
- 5) A description of the problem or observations

Ship pre-paid to:
Vortex Technologies, Inc.
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Sugar Grove, Illinois 60554
USA

