



CleanXtract 96

Instructions for Use

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REF CXT-1096



CleanNA, Coenecoop 75, 2741 PH, Waddinxveen, The Netherlands

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Manufacturer:

CleanNA

Coenecoop 75

2741 PH Waddinxveen

The Netherlands

Email: info@cleanna.com

Phone: +31 (0) 182 22 33 50

www.cleanna.com

Symbols

The following symbols can be found in this manual:



Caution

Warnings and precautions

⚠ Caution: Users must read the safety instructions carefully before running the CleanXtract 96 instrument.

Safety

The following basic safety measures must be followed during all phases of operation, maintenance and repair of the instrument. In case of failure, follow these measures and/or warnings/notes.

CleanNA shall not be responsible for consequences or incidents caused by the user's failure to follow the safety instructions.

1. Grounding of the instrument

In order to avoid electric shock incidents, the instrument's input power cord must be properly grounded. This instrument uses a 3-pin grounding plug with a 3rd (grounding) pin, which can only be used with a grounded power socket and functions as a safety device. If it is not possible to insert the plug into the electrical socket, the socket must be correctly fixed by an electrician. If not, the grounded plug loses its protection function.

2. Instrument repair

Instrument repair activities shall only be executed by service specialists trained and authorized by CleanNA. Only CleanNA is allowed to replace parts or adjust the machine inside. Warranty will be voided if this instruction is not followed.

3. Use of power supply

Before connecting the power cord, make sure that the AC power voltage and frequency are consistent with the instrument requirements. Verify that the instrument is switched off before plugging the power cord into the outlet.

4. Power cord


- Do not touch the power switch and power cord with wet hands.
- Do not unplug the power cord before turning off the instrument.
- Do not clean the instrument before disconnecting the power.
- Do not change the fuse before disconnecting the power.
- Turn off the power when the instrument is not in use.


5. Placement of the instrument

This instrument must be placed in a room which is well ventilated with low relative humidity, not dusty, and free from corrosive gas and interference of strong magnetic presence. It must be placed away from water sources (i.e water sink, water fountains). Do not place the instrument on unstable surfaces or in direct sunlight. The instrument is best kept away from gas and heat sources.

The ventilation openings on this instrument are for the circulation of air and in order to avoid the instrument from over-heating the instrument's ventilation openings must not be blocked or covered (see Figure 2). Over-heating will impair the test performance or result in instrument failure.

If the instrument is to be set aside for a long time, the power plug shall be withdrawn and the instrument covered with soft cloth or plastic film to avoid dust from accumulating inside the machine.

 **Caution:** This instrument is under protection level IP20. It is for indoor use only.

 **Caution:** In any of the following cases, immediately cut off the power supply, withdraw the power plug from the electrical socket, and contact CleanNA for assistance:

- Fluids of the used kit are spilled into the machine.
- External water or other fluids are spilled into/onto the machine.
- The instrument is not functioning properly, instrument generates abnormal sounds or odors;
- The instrument is dropped or the casing is damaged;
- The instrument's functioning has been changed significantly.

6. Safety signs:



Warning Sign



High Temperature Sign

The instrument is delivered with warning signs and high temperature signs in order to insure the safety of the user. Do not touch the heating module during operation as to avoid the skin from being burned.

After sales service

The warranty content and scope are shown in the warranty sheet.



Caution: After unpacking the instrument, check to see if the contents listed on the packing list are present with the delivery. In case of damaged or missing contents, please contact the supplier.

After unpacking, both the box packaging and the other packaging materials must be well kept for future repairs at the supplier. CleanNA is not responsible for damages to the instrument during transport due to improper packaging in non original packing material.

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Introduction

This chapter mainly introduces the features and uses of the instrument.

Intended use

The CleanXtract 96 is used for the purification of nucleic acids with magnetic beads. It is used to extract nucleic acids from different types of biological samples, depending on the used nucleic acid extraction kit. The instrument must be used by a trained molecular biologist in a molecular biology laboratory.

Principle

The instrument makes use of a stepper motor and achieves precision transmission through the single-chip microcomputer that controls the magnet, as to automatically complete the nucleic acid purification process. It is compact, lightweight, low noise and completely closed off from the rest working area. The transparent working chamber makes it easy to observe the samples in the instrument during an experiment. The CleanXtract 96 also contains a large touch screen which makes the instrument easy to operate. Door opening protection, ultra-limit position protection and an alarm increase the safety and reliability.

Most of the CleanXtract 96 experiments follow the principle lyse, bind, wash, elute. The comb of the CleanXtract 96 mixes the sample in the lysis buffer with the binding buffer and the magnetic particles. In this step, the DNA/RNA binds to the magnetic particles. The CleanXtract 96 magnet in the comb separates the magnetic particles from the lysates and transfers them to the next plate. After a few rapid wash steps to remove trace contaminants, the instrument elutes the DNA/RNA in the final elution plate.

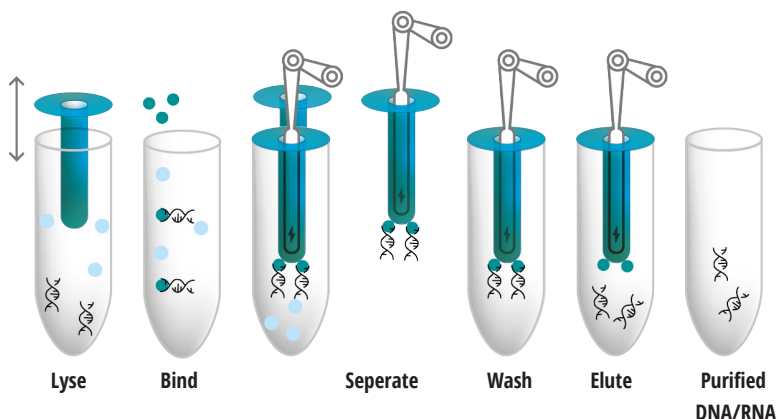


Figure 1: Graphic of a possible CleanXtract 96 workflow.

Script name clarification

The names of the scripts for the CleanXtract 96 follow the composition below:
Device_Kit_Input material + volume_lysis or extraction protocol_version

For this device, it is always “CXT96” followed by the abbreviation of the kit. Then the input material and input volume of the protocol are mentioned. The input material is mentioned with two letters and the input volume in microliters or milligram. This is followed LS (lysis) or EX (Extraction) protocol. Finally, the version of the script is shown with a “V” and then the version number.

Preparation

This chapter focuses on the preparations to perform in order to start using the instrument. It should be read carefully before using the machine and performing any experiment for the first time.

Overview of the CleanXtract 96



Figure 2: Overview of the different components of the CleanXtract 96.

Required consumables

Depending on the number steps the procedure has, one comb and a number of 96-deep well plates are required in the process.

Check before starting up

Before inserting the power plug to into the instrument, you should first confirm the following:

- Whether the power supply meets the voltage required by the instrument;
- The power cord plug is securely plugged into a power outlet;
- The power cable is properly grounded;

Starting up

Turn on the power button of the CleanXtract 96 instrument. The screen will display the CleanNA logo and the instrument will perform a self-test. This test takes about 5-8 seconds. After a successful self-test, the main menu is displayed on the screen and the files can be edited, reviewed, deleted and so on.

UV decontamination

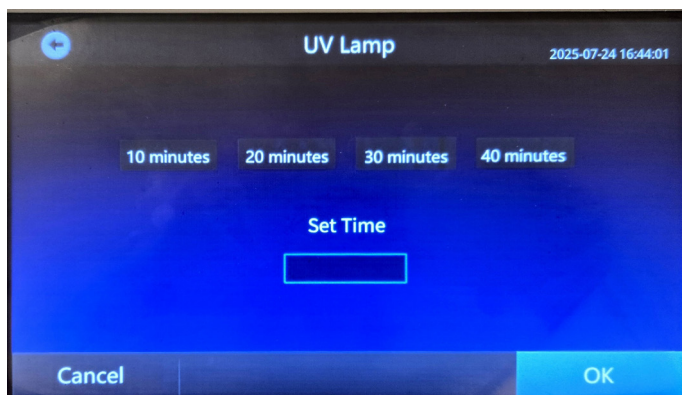


Figure 3: UV Lamp Settings interface of the CleanXtract 96.

Press 'UV Lamp' on the main interface of operation, and select one of the timing presets or put in your own run time underneath the 'Other Time' prompt. Press 'OK' to turn on the light in the operation area to sterilize the inside of the instrument before and after each experiment.

Operation guide

This chapter describes how to edit, review, modify, and delete files and how to run/stop files.

Caution: If there are any abnormal sounds, display notifications after the instrument is switched on or an alarm goes off during the instrument self-testing, please switch off the power immediately and contact CleanNA.

File management

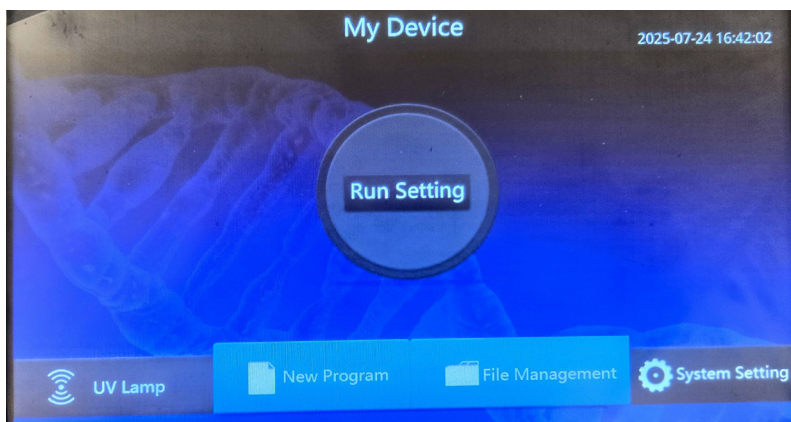


Figure 4: Main control interface of the CleanXtract 96.

In the main control interface, press 'File Management' to enter the file management interface shown in Figure 5.



Figure 5: File management interface of the CleanXtract 96.

File management includes the next options: New, Delete, Rename, Move, Copy and Open. Press the icon of choice to carry out corresponding operations on the selected folder or file.

Edit file

In the main control interface, select 'New program' to enter the new file interface. Press the 'New program' icon to create a new file, or press the 'Open File' icon to open the file's setup in order to edit the data.

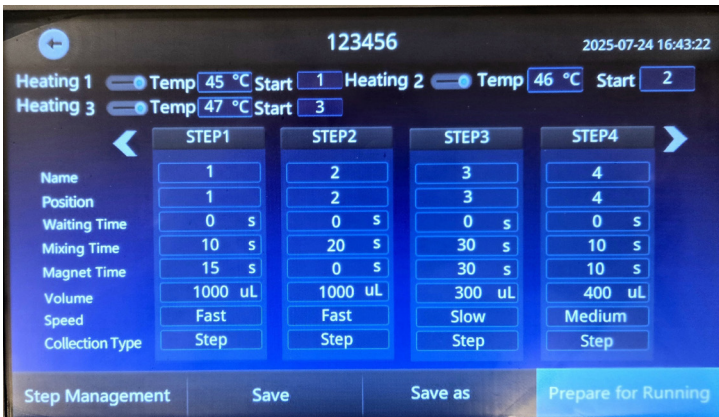


Figure 6: File edit interface of the CleanXtract 96.

In the file edit interface, the interface displays three heating positions. Each of these displays includes functions to alter: step name, well site, waiting time, mixing time, magnetic absorption time, volume, speed and adsorption mode settings. In the information of experimental steps, each item can be set separately. After the setup is completed, you can click save, save as or prepare for running.

Click the 'Step Management' in the file editing interface to delete, move up, move down, insert in front and insert after the steps in the file. Press 'Finish' to return to the previous interface.

Placement of 96 deep well plates and tip position

Depending on the procedure, the 96 deep well plates need to be placed in the right positions with the first plate below the tip head. In the main interface, click on the circle in the middle to enter the select position interface. The heated positions are displayed in red.

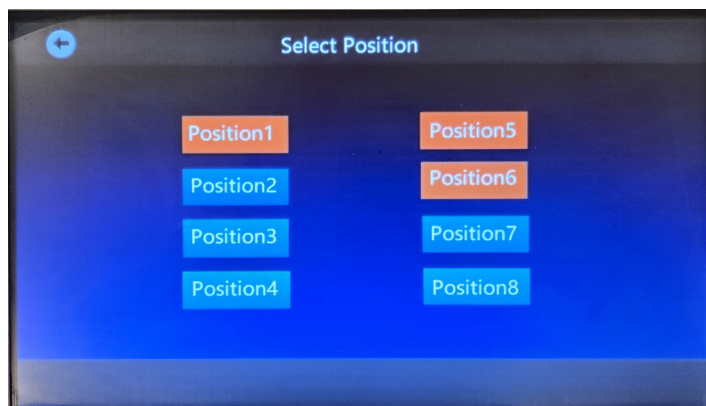


Figure 7: Select position interface of the CleanXtract 96.

For every plate, click on the position where it needs to be placed and place it afterwards by opening the door on the right side of the CleanXtract 96. There are two limit blocks on the upper and lower sides to assist position to help fixate the 96 deep well plate into the instrument positions. Pay attention to place the 96 deep well plate completely flat and place these before running any experiments. The plate is placed correctly if you hear a click.

When all the plates are in the right position, make sure the right plate is below the tip head before starting the experiment.

Run

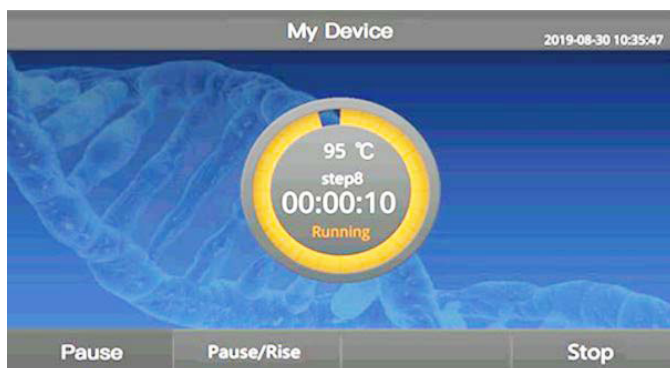


Figure 8: Operation details interface of the CleanXtract 96 during a run.

In the operation details interface, the temperature, elapsed time, and running status of the current experiment is shown. Press the center of the interface to view details of the run. The circular progress bar indicates how far the experiment is completed.

The bottom left side shows the pause icon and Pause/Rise icon and the right side shows the stop icon. Press the pause icon to stop the operation, after which the display turns into the continue icon. Press continue to start the operation once again.

Press the Pause/Rise icon to stop the operation. After pressing the Pause/Rise icon, the magnetic bar can return to the original position and reagents can be replaced. Press the Drop/Continue icon to continue the operation afterwards.

System setting



Figure 9: System setting interface of the CleanXtract 96.

On the main control interface, press ‘System Setting’ to enter the system setting interface. This interface includes: Firmware Upgrade, Motion Parameter Setting, Reminder Settings, Time Setting and About.

Motion parameter setting

Click “Motion Parameter Setting” in the system setting interface, enter the initial password “123456”, and click “confirm” to enter the parameter setting interface.

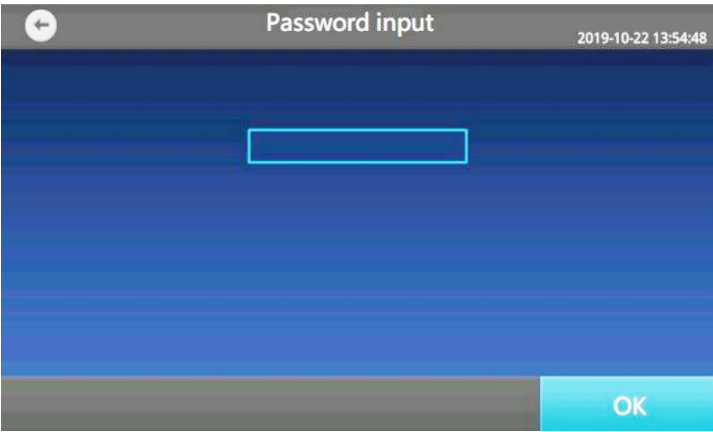


Figure 11: Password input interface for entering the motion parameter settings.

The motion parameter setting interface includes: Fast speed, Medium speed, Slow speed, Stick Position, Tip Position, Origin Setting and Temperature Correction 1-8. After

the relevant parameters are set, press 'OK', and return to the main interface. After the main interface of the control is displayed, the next operation can be carried out.

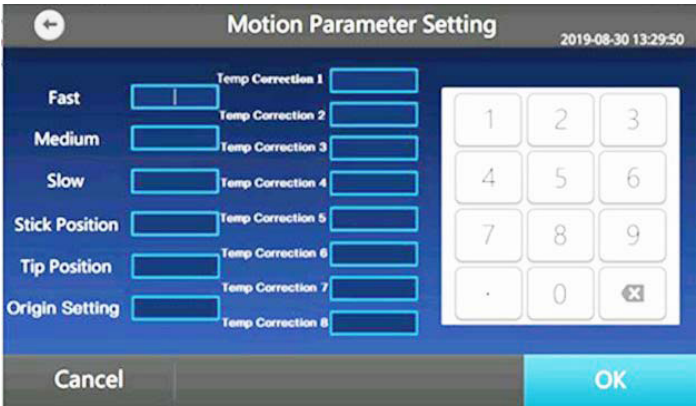


Figure 12: Motion Parameter Setting interface of the CleanXtract 96.

Reminder settings

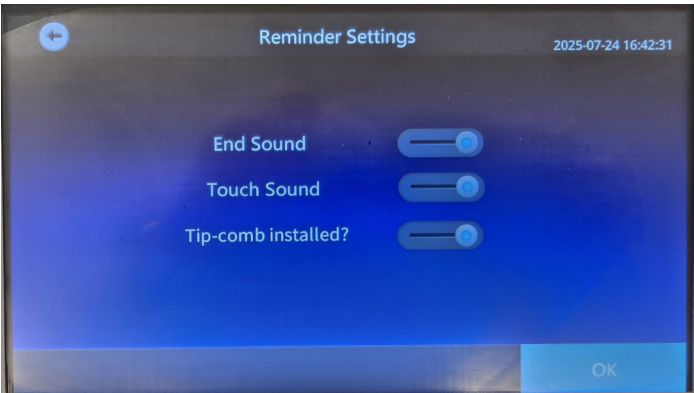


Figure 13: Reminder Settings interface of the CleanXtract 96.

Press 'Reminder Settings' on the system setting interface to enter the Reminder settings interface. Slide/press the options 'End Sound', 'Touch Sound' and 'Tip-comb installed?' to the blue position to turn these sounds/notifications on. Slide/press the buttons to the gray position to turn them off. Press 'OK' and return to the boot interface. When you turn on the tip-comb reminder setting, the system will ask if the tip-comb is properly installed before the run. The system turns on the sound by default. If the sound needs to be turned off then it must be redone every time the instrument is switched on.

Time setting



Figure 14: Time Setting interface of the CleanXtract 96.

Press 'Time Setting' on the system setting interface to set the time displayed by the instrument. Press 'OK' to return to the boot interface.

About



Figure 15: About interface of the CleanXtract 96.

Press 'About' in the system setting interface to display the serial number, software version number, screen firmware number of the instrument. Press 'OK' to return to the system setting interface.

Update software and Firmware

Software

1. Copy the software file to an USB drive and rename it to “DCIOT.PKG”. Then insert the USB drive into the USB interface marked “A” on the left side of the CleanXtract 96, as indicated in Figure 16.



Figure 16: USB port A highlighted in red where the USB drive needs to be inserted to update the software on the CleanXtract 96.

2. Turn on the CleanXtract 96.
3. The software will automatically start to update.
4. When the update is finished, remove the USB drive and shut down the CleanXtract 96.
5. Restart the CleanXtract 96 to finalize the software update.
6. Delete the “DCIOT.PKG” file from the USB drive to avoid auto upgrading when using the USB drive to import and export scripts.

Firmware

1. Copy the firmware file to an USB drive and rename it to “upgrade.bin”. Then insert the USB drive into the USB interface marked “B” on the left side of the CleanXtract 96, as indicated in Figure 17.



Figure 17: USB port B highlighted in red where the USB drive needs to be inserted to update the firmware on the CleanXtract 96.

2. Turn on the CleanXtract 96.
3. Select "System Setting" on the bottom right corner of the main screen interface, as shown in Figure 18.

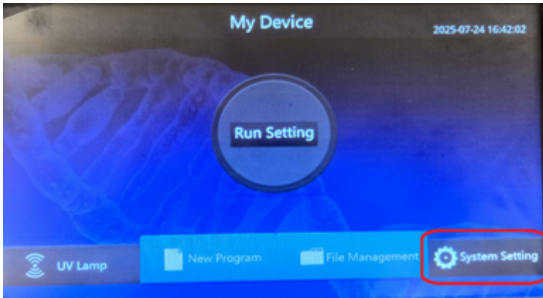


Figure 18: Main screen interface of the CleanXtract 96, with the system setting highlighted in red.

4. Press "Firmware Update" at the top of the system setting menu, as indicated in red in Figure 19.



Figure 19: System setting interface of the CleanXtract 96, with the Firmware Upgrade setting highlighted in red.

5. The CleanXtract 96 will automatically update the firmware. Furthermore, a progress bar will appear around the words "Firmware Updating", as shown in Figure 20.

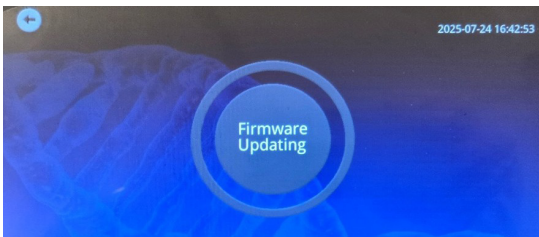


Figure 20: Firmware updating interface of the CleanXtract 96.


6. After the firmware is updated, a message will appear. Press "OK".
7. Remove the USB drive from the CleanXtract 96.
8. Delete the "upgrade.bin" file from the USB drive to avoid auto upgrading when using the USB drive to import and export scripts.
9. The firmware update for the CleanXtract 96 is now finished.

Technical specifications

This chapter mainly contains the use, transportation and storage conditions of the instrument, as well as its basic parameters, performance and functions.

Normal working conditions

	Characteristics
Ambient temperature	10°C ~ 30°C
Relative humidity	≤70%
Power supply	AC100-240V 50/60HZ 350 W
Altitude	applicable at an altitude under 2000 meters

 **Caution:** Before using the instrument, please confirm whether the working conditions meet the above requirements. Pay special attention to whether the power cord is reliably grounded.

Transport and storage conditions

- Ambient temperature: - 20°C ~ +55°C
- Relative humidity: ≤80%

Basic parameters

Parameters	CleanXtract 96
Sample processing quantity	96 T/time
Permanent magnetic bar (fixed)	12×8 pcs
Sample handling range	50~1000 µl
Magnetic bead collection efficiency	≥98%
The most suitable size of magnetic beads	0.1~1.0 µm
Overall dimensions	600×620×420 mm (L×W×H)
Instrument weight	40 kg

Software Functions

- File edit, view, modify and delete functions
- File run, pause and stop functions
- File import and export by flash disk
- Fault protection and alarm function
- UV lamp on and timed off function
- Unlimited program storage




Caution: The above software functions are for reference only and are subject to change without notice.

Troubleshooting Guide

This chapter mainly introduces problems that could occur during operation and possible causes and solutions for them.

SN	Problem	Possible cause	Solution
1	The interface is not displayed after turning on the power switch	Not powered	Check the power supply and turn the instrument on once again
		Fuse burned	Replace the fuse (F 250 v 3 a Φ 5 x20)
		Switch damaged	Replace switch itself
		Other reasons	Contact CleanNA
2	Alarm is going off during experiments	Extreme position of moving parts	Run the file again; Contact CleanNA
3	The screen displays abnormal characters and symbols	Poor chip contact	Contact CleanNA
		The chip is damaged	
4	Panel button does not work	Touch screen is damaged	Contact CleanNA

 **Caution:** During the warranty period, users are prohibited from opening the casing of the instrument for inspection. If any fault that requires opening the housing for inspection occurs as listed in the table, contact your supplier.

Ordering Information

Product	Pack Size	Part Number
CleanXtract 96	1 System	CXT-I096

Document Revision History

Manual Version	Date of revision	Revised Chapter	Explanation of revision
1	30/JUN/2022	Initial version	Initial version
2	26/JUL/2022	Warnings and precautions	Corrections in warnings and precautions
3	01/AUG/2022	Contents	Minor correction
4	24/AUG/2022	Text	Minor changes in text
5	30/JAN/2024	Ordering Information, page 2 , Workflow	Deleted Deep well plate and comb and correction in address details. Updated workflow picture.
6	26/AUG/2025	script name clarification, update firmware & software, check software & firmware version	Added script name clarification, update firmware & software and check software & firmware version. Updated pictures and caution style.

Appendix

Appendix 1: Overview of Toxic Substances Present in Electronic Products

Parts	Lead (Pb)	Mercury (Hg)	Cadmium (Cd)	Hevavalent Chromium (Cr6+)	Polybrominated diphenyl ether (PBDE)
Housing	X	0	0	0	0
Motor Component	X	0	0	0	0
Circuit Board/ Device	X	0	0	0	0
Electronic Line	X	0	0	0	0
Structural Component	0	0	0	0	0

O: Indicates that the content of this toxic and hazardous substance in all homogeneous materials of this part is below the limit requirement stipulated in SJ/T-11363-2006 *Limited Requirements for Toxic and Hazardous Substances in Electronic Information Products*.
X: Indicates that the content of the toxic and hazardous substance in at least one of the homogeneous materials of the part exceeds the limit requirement.

Contact

Coenecoop 75 | 2741 PH Waddinxveen | The Netherlands

T: +31 (0) 182 22 33 50 | F: +31 (0) 182 22 33 98 | info@cleanna.com

www.cleanna.com

