



PDQeX Nucleic Acid Extractor

Product Manual

*prep***GEM**

*forensic***GEM**

*phyto***GEM**

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PDQeX Nucleic Acid Extractor

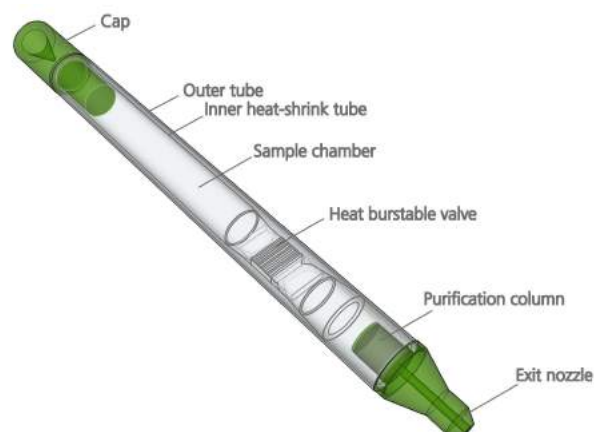
The simplicity and minimal sample manipulation requirement of the PDQeX make it an attractive option for obtaining DNA samples.

Jo-Ann Stanton, PhD

Department of Anatomy, University of Otago

New Zealand

MicroGEM's PDQeX Nucleic Acid Extractor brings together powerful enzymes with an innovative extractor cartridge and purification matrix. The temperature-driven single-tube system produces extracts in significantly less time (minutes, not hours) than other extraction methods.



PDQeX Extraction Reagents consist of a cocktail of thermophilic proteinase and mesophilic cell wall degrading enzymes that systematically lyse cells, destroy nucleases, digest proteins, and release nucleic acids. Each reagent kit is specially formulated for specific sample types.

PDQeX Extractor Cartridges, made from thermo-responsive polymers, pump extracted DNA through the purification matrix while removing cell debris and inhibitors.

Specifications

Sample capacity	24 samples, standard 96 well spacing
For use with	24 PDQeX cartridges (200 µL)
Interface	5" touch screen (color)
Voltage (24 V DC adapter included)	100-240 VAC, 2A, 50/60 Hz
Power	96 watts at peak draw
Thermal profiles	Pre-installed and user programmable
Programmable thermal range	34-120° C
Dimensions	22 x 18 x 18.5 cm (L x W x H) (8.5" x 7" x 7.25")
Weight	4.8 kg (10.6 lbs)

Perfect for a wide range of sample types including:

Plant material Animal tissue Forensic evidence and human ID Bacteria Viruses Insects

Process Overview

Step 1: Sample preparation

Sample preparation prior to extraction varies from sample to sample. Refer to each kit's Quick Start Guide for specific sample preparation guidelines.

Step 2: Cell lysis, DNA extraction and purification

This multi-stage process takes place inside the extractor cartridge.

1. The cells are lysed by a cocktail of enzymes. This cocktail varies for different substrates. For example, the lysis of leaf tissue requires a complex mixture of hydrolases and a specific program on the PDQeX to activate them.
2. A temperature regimen is carried out by the PDQeX for different enzymes at different temperatures. The final temperature inactivates the enzyme leaving a lysate containing DNA, cell debris, and denatured protein.
3. On completion of the extraction, the extractor cartridge forces the extract through a special column. The columns are tailored to each sample type and designed to remove anything that may inhibit *Taq* DNA polymerase or enzymes used in most other downstream processes.
4. The samples are ejected into PCR tubes in a standard format (8 strips or 3x8 strips).

Step 3: Quantification

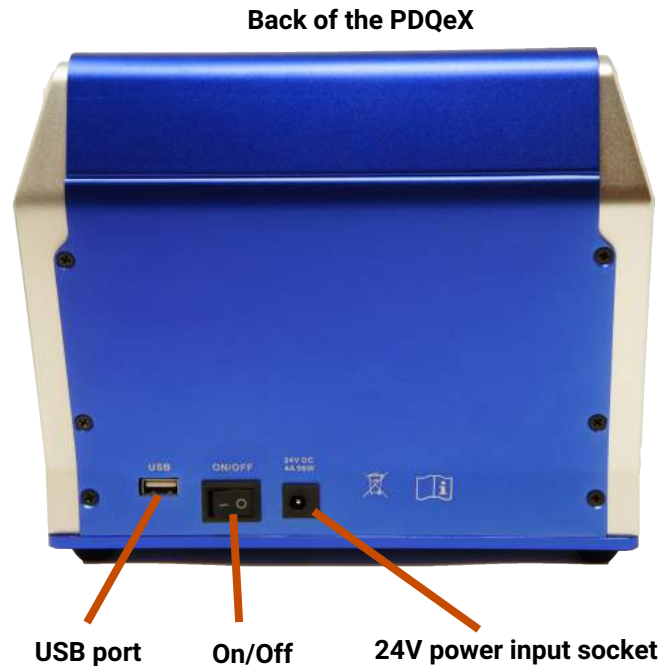
The DNA is now ready for quantification. Because the heat step denatures the DNA, do not use OD or fluorescent dye methods. The best method for quantification is qPCR. With normalized samples, quantification is not always required and the DNA can be used directly.

Operating Instructions

Device set-up

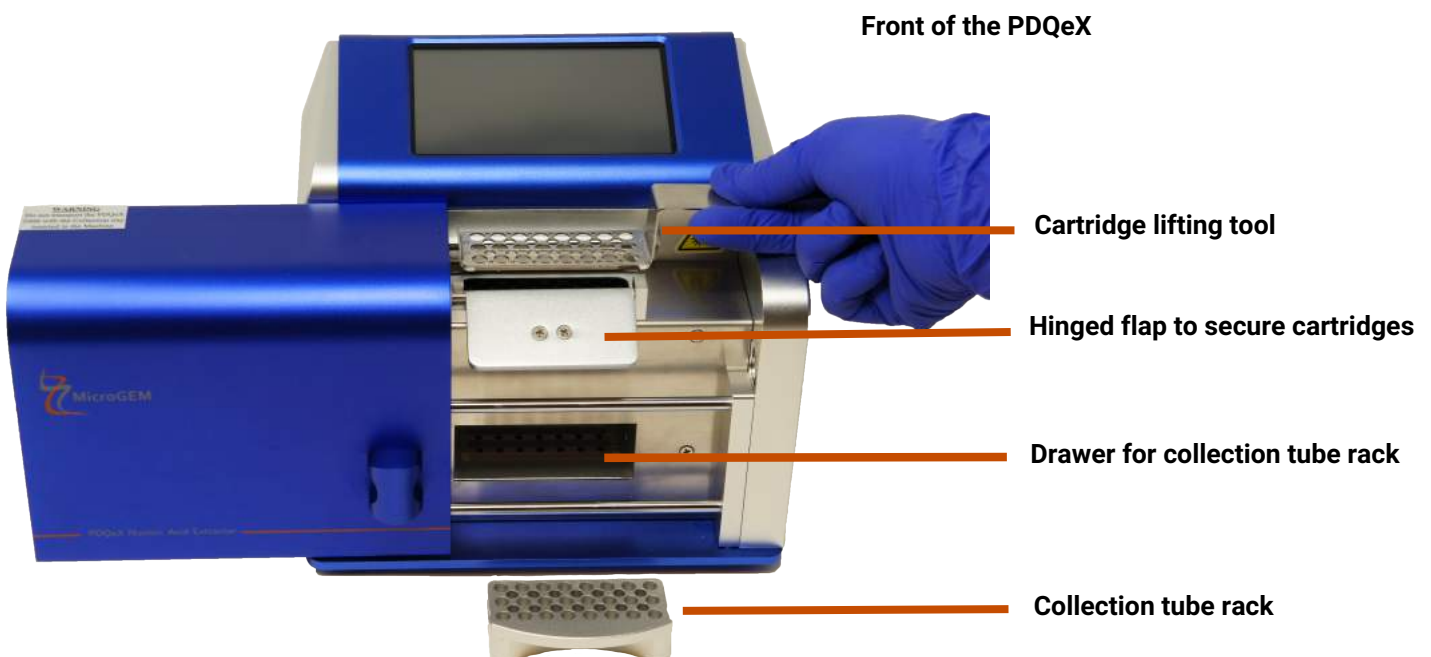
Connect the PDQeX to the power supply and switch on. Only use the power supply provided with the PDQeX.

WARNING: The PDQeX should be installed with easy access to disconnect from the power supply.



Do not place the PDQeX close to a RF transmitter. A low power transmitter, such as a cordless or mobile phone, should be at least 2M from the PDQeX. A powerful transmitter, such as a commercial TV or radio broadcast antenna, should be at least 25M away.

The USB port is for software upgrades only and is not to be used for other purposes.



Operating Instructions

Loading and unloading the PDQeX



The door of the PDQeX slides horizontally left and right. The door will lock during operation or UV decontamination.

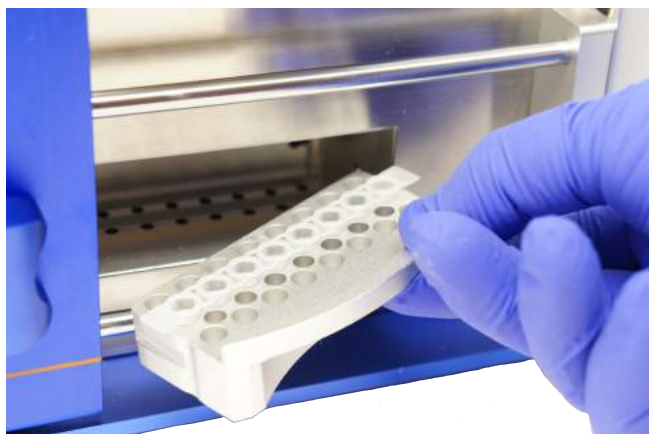
Before inserting any cartridges into the block, ensure the lifting tool is in place, making it easier to remove spent cartridges after the run is complete.



Pull out the collection tube rack and place 0.2 ml PCR tubes firmly into the rack.

The rack will accommodate up to three 8-strip PCR tubes.

Remember where you have placed the collection tubes. You will need to place the cartridges in the same position in the cartridge block.



Replace the rack into its slot in the PDQeX and firmly push into place.

Operating Instructions



Load your sample into the PDQeX extractor cartridge.

This part of the procedure differs depending on the sample type. The sample may be in suspension, a solid or a disk of storage card.

Insert the cap into the cartridge.



Load the cartridges into the holes of the cartridge tray in the same position where you placed the collection tubes.

When all the cartridges are loaded, lower the hinged flap onto the caps of the cartridges and close the sliding door.

Make sure the cartridge positions in the cartridge tray correspond to the collection tubes below - otherwise you will contaminate the device.

WARNING: The lower end of the PDQeX cartridge is designed to fit inside the collector tube. If it is above the upper lip of the tube, there is a risk of cross contamination. This problem may occur when lower profile collection plates or tubes are used.

Contact MicroGEM at info@microgembio.com if you need a collection drawer tailored for the profile of your tubes.

Operating Instructions

Loading and unloading the PDQeX



After running the device, the DNA will be in the collection tubes.

First remove the PDQeX extractor cartridges and dispose. Slide out the drawer.

Remove and cap the collection tubes and store at -20°C .

Notes

The door of the device will lock while the block is hot.

For sequential runs, make sure the block temperature has fallen below the first temperature used in your program.

Carefully remove tubes to prevent contamination of the block.

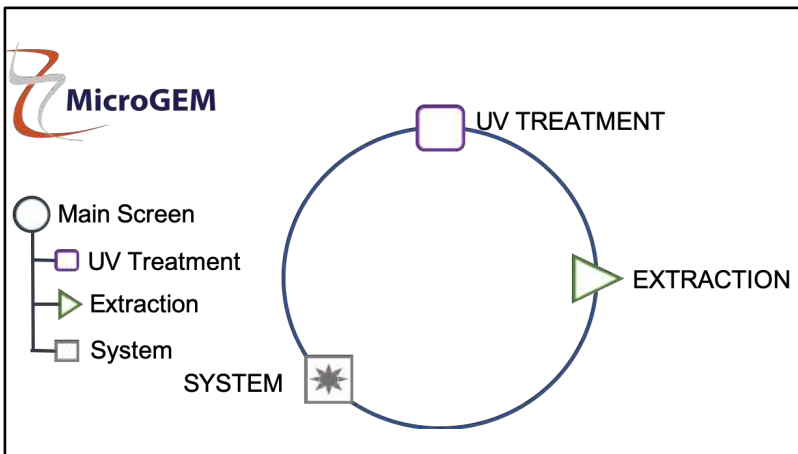
Tubes cannot be re-used if you abort a run.

Operating Instructions

Running your program

The PDQeX is controlled by a touch-screen. The following section provides an overview to help navigate through the controls.

1. Home Screen

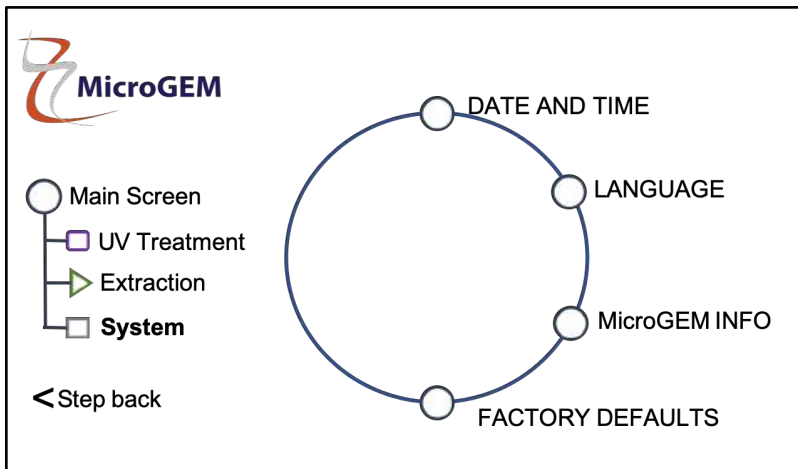


The home screen provides three options:

1. System settings
2. UV treatment (sterilization)
3. Extraction

To the left of the screen is a map to help navigate the program.

2. System Settings

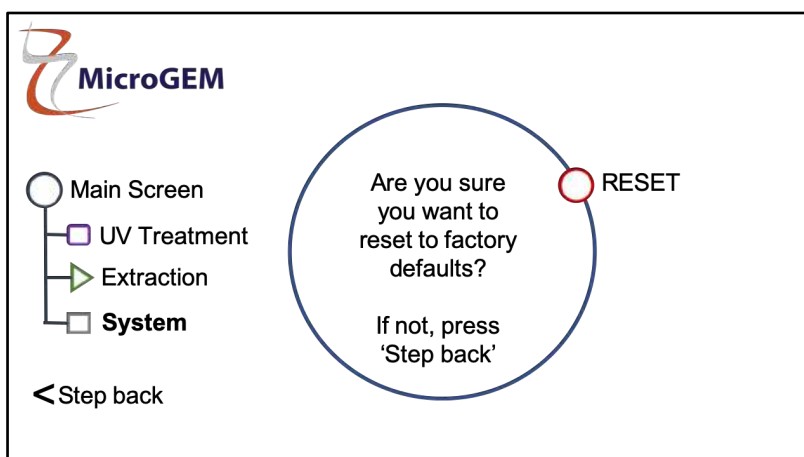


The system settings window allows you to:

1. Set date and time
2. Obtain more information
3. Reset to factory defaults

Future releases will allow you to pick your preferred language.

2.1 Factory Reset

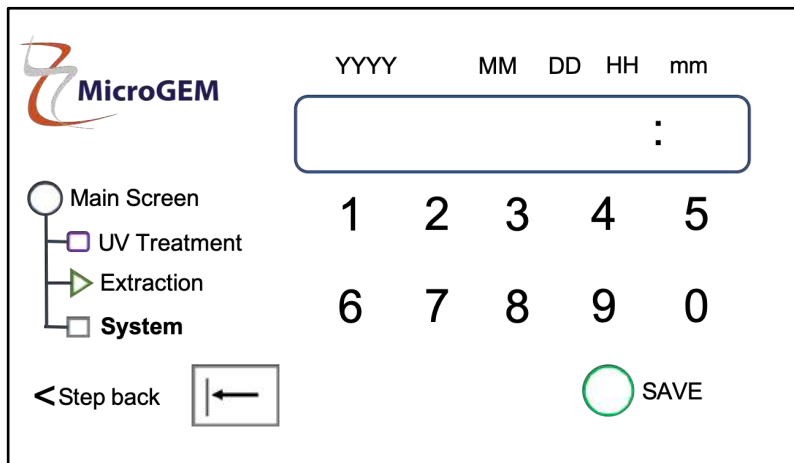


The device arrives with a number of pre-installed programs. A factory reset restores the programs if lost.

However, if you choose to reset, all custom programs will be removed and the date and time will need to be reset.

Operating Instructions

2.2 Date and Time



Set the date and time using the keypad and press **Save**.

2.3 QR Code



The last system option provides a QR Code to access more information from the MicroGEM website.

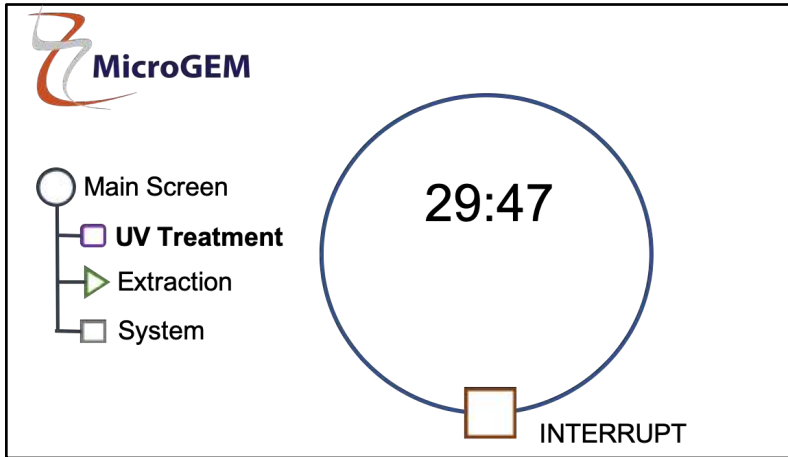
3. UV Treatment

The PDQeX is fitted with four UV strip lights to reduce DNA contamination. Three lights are situated below the collection tube drawer. The drawer should be removed before treatment to allow the light to access the lower side of the heating block. The other light is above the heating block. During UV treatment, the sliding door will be locked.

WARNING: Do not operate the UV light without closing the door. Avoid looking directly at the UV light.

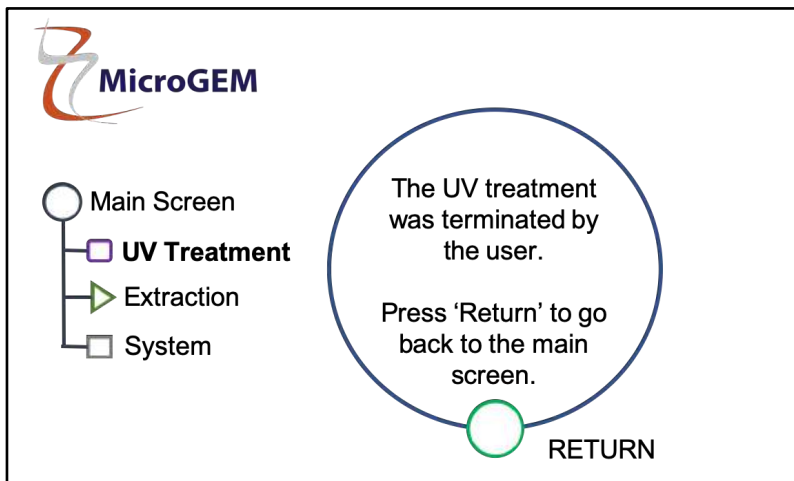
The UV treatment will only remove superficial contamination. For more serious spills, clean the inside of the device using a cotton swab soaked in 1% bleach. Follow this by swabbing with 80% ethanol.

Operating Instructions

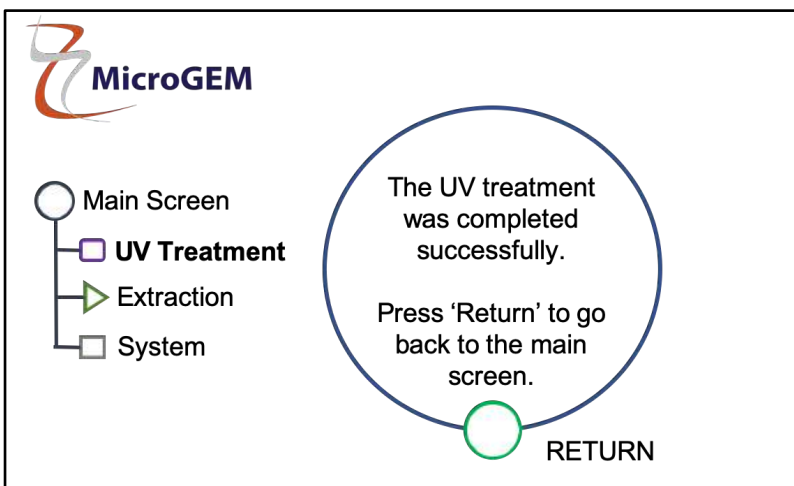


Press 'UV Treatment' on the home screen. The procedure takes 30 minutes and can be interrupted at any time.

Press **Interrupt** to stop the UV treatment.



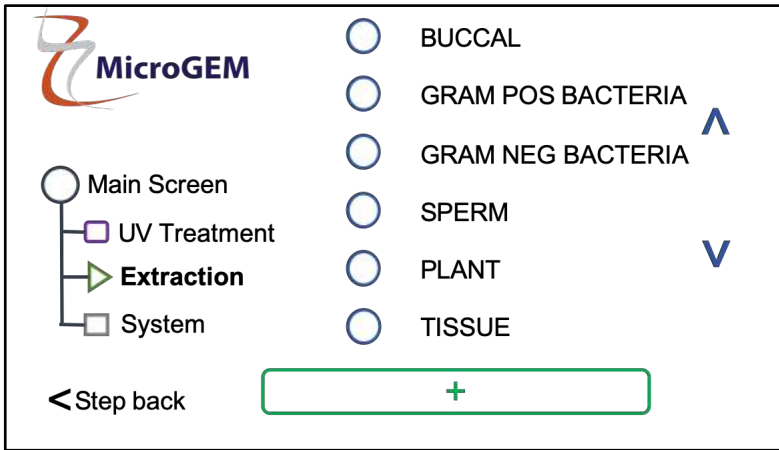
After interrupting the program, press **Return** to go back to the home screen.



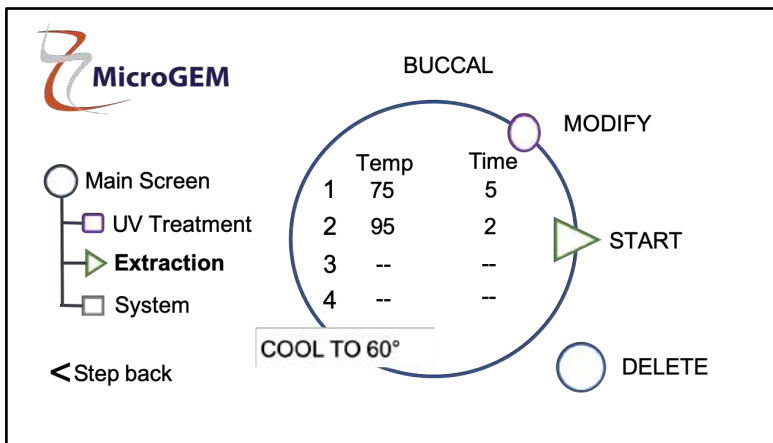
After the treatment is complete, press **Return** to go back to the home screen.

Operating Instructions

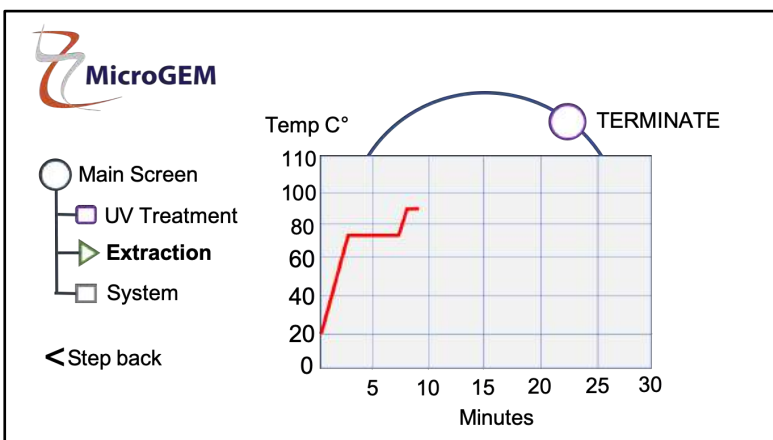
4. Running Pre-defined Programs on the PDQeX



On the home screen, press **Extract**.
Select the program you want to run.



The temperature regimen will be shown.
Press **Start**.



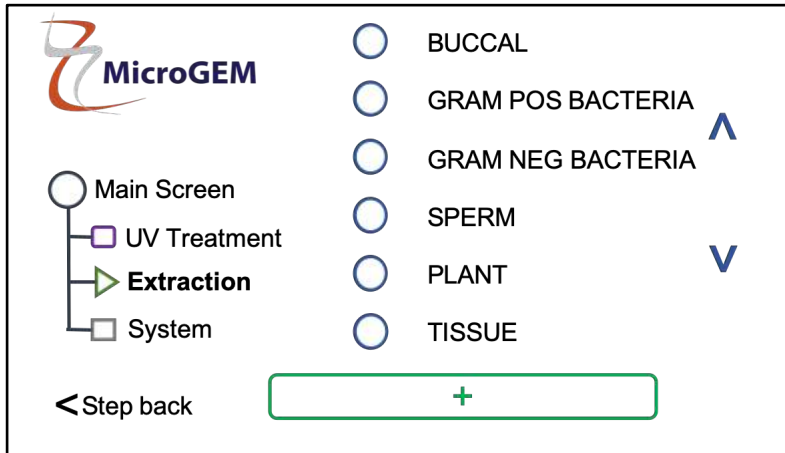
The PDQeX will switch to a display showing the progress of the program.

At any time, the program can be terminated but the samples and tubes cannot be reused.

Once the run is complete, a prompt will appear to return to the extraction screen.

Operating Instructions

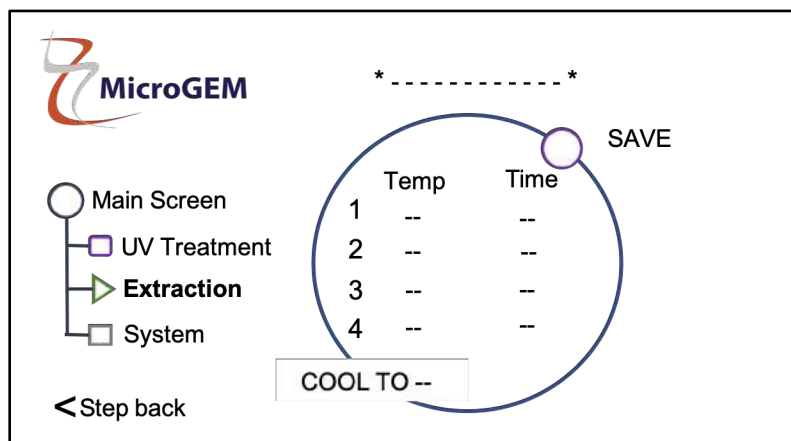
5. Writing a Custom Program on the PDQeX



From the home screen, press **Extract**.

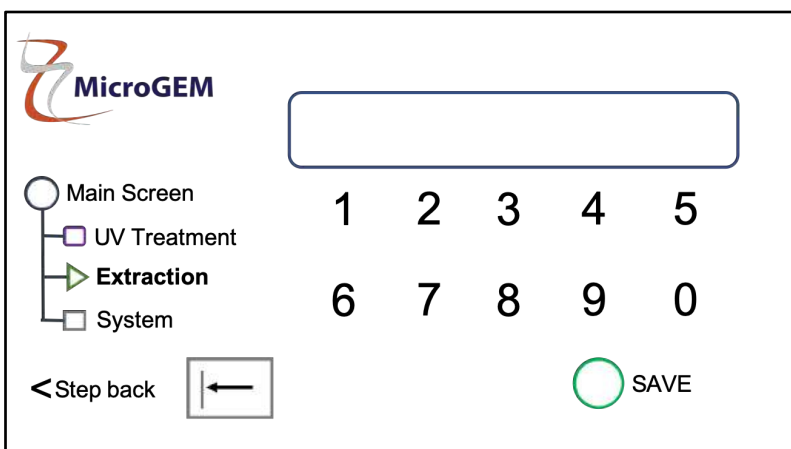
Instead of choosing one of the pre-defined programs, it is possible to create a custom program. This can be useful for optimizing the PDQeX for specific sample types.

Press the **+** button.



Click on the dashed line at the top of the screen (*-----*) and give the custom program a name. A program cannot be saved without a name.

Press on the temperature/time symbols (--) to add temperature and time values.



Use the number keypad to enter temperature (C°) and time (minutes) values.

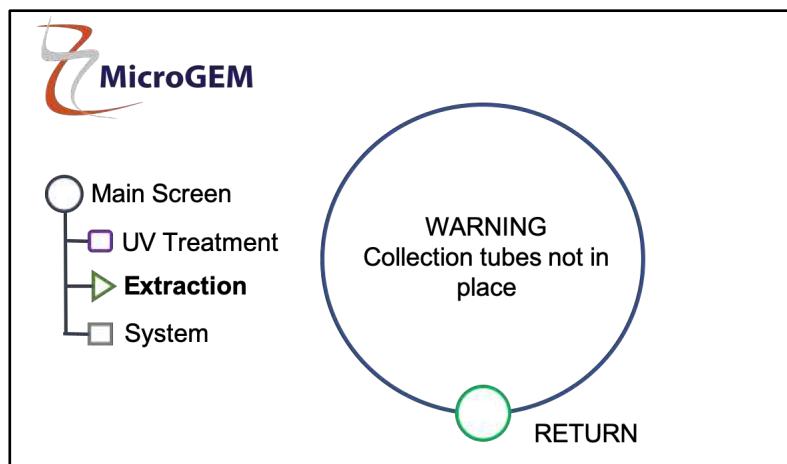
Press **Save**. You must add a final cool step before the program can be saved.

When you have completed all the entries and saved the program, proceed with the steps in section 4.

Operating Instructions

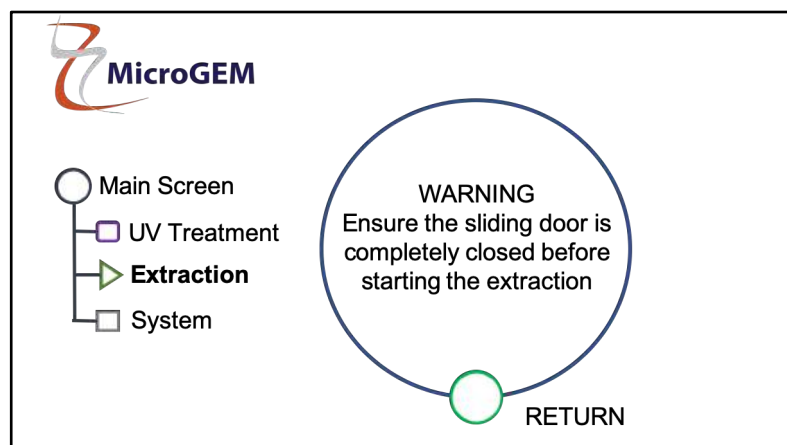
6. Error Messages

A few common mistakes may be detected by the device.



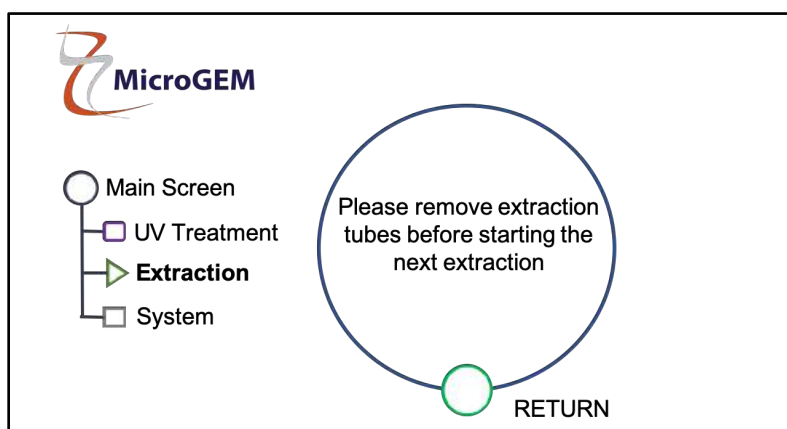
The PDQeX has a sensor at the back of the collection tube drawer. If the drawer is not in place or is crooked, the device will not run.

This prevents DNA from being contaminated.



Make sure the sliding door is fully closed before running the PDQeX.

The block is hot and could burn fingers.



This message is a reminder that the same tubes cannot be run twice if a run has been aborted.

Cleaning, Sterilization, Inspection, and Maintenance

Cleaning and Sterilization

Collection trays and cartridge holders should be cleaned and sterilized in accordance with laboratory procedure.

The UV treatment option on the control screen gives a 30-minute UV light exposure (see pages 10-11).

In the event of gross contamination of the heating block or device, clean with a cotton swab and wipe with 0.5% bleach followed by a thorough removal of the bleach with water-dampened swabs and wipes.


Aluminum parts of this device should not be soaked in virkon or bleach. Extended use of chemical agents such as these will corrode the parts.

WARNING: Do not get liquids inside the device.

If bleach must be used, be sure ALL of it is removed.

Safety Label

The following label may be displayed on the device:

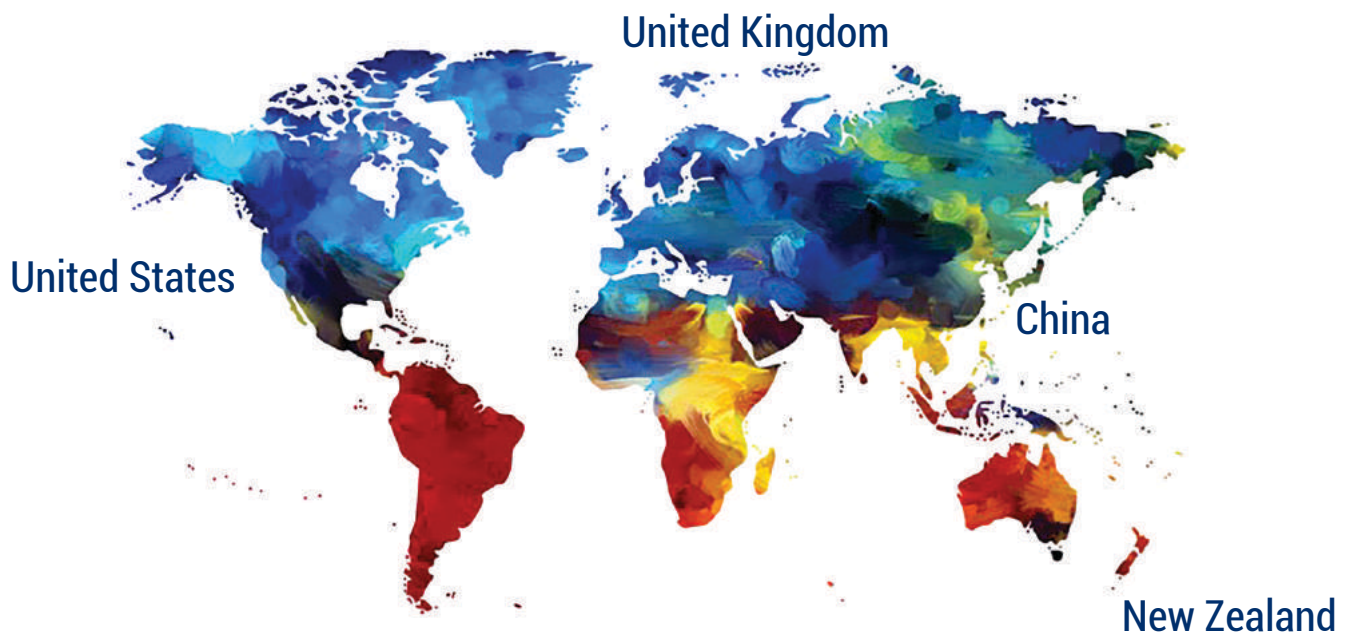
Hazard Symbol	English	Francais
	WARNING: Avoid looking directly at the UV light	AVERTISSEMENT: Évitez de regarder directement à la lumière UV

Inspection and Maintenance

The PDQeX has been designed to require no operator maintenance.

Disposal of Waste

Used PDQeX cartridge tubes should be disposed as hazardous waste in accordance with laboratory protocols.



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MicroGEM is committed to minimal packaging and a vibrant, sustainable world.

info@microgembio.com

+1-434-529-8212

www.microgembio.com