

KCMC Biotechnology Laboratory	STANDARD OPERATING PROCEDURE	Effective Date	SOP-Number EQP.011
		Page 1 of 9	Date DRAFT
Title: OPERATION AND MAINTENANCE OF ELGA™ WATER DISTILLATION UNIT			

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Annual Review	
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KCMC Biotechnology Laboratory

STANDARD OPERATING PROCEDURE

Effective Date

SOP-Number
EQP.011

Page 2 of 9

Date
DRAFT

Title: OPERATION AND MAINTENANCE OF ELGA™ WATER DISTILLATION UNIT

Document History:

Version Number	Reason for Changes	Date

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Title: OPERATION AND MAINTENANCE OF ELGA™ WATER DISTILLATION UNIT**PURPOSE**

For the production of reagent quality deionised water for laboratory use.

PRINCIPLE

Water from the main potable water source is passed through the following cartridges and UV lamp in the following order:

Pretreatment Cartridge – removes particulate matter and excess chlorine

Reverse Osmosis Cartridge – Splits the flow of water into a 1) a permeate stream which will be further purified, 2) a waste concentrate which will be passed to drain.

UV Chamber – permeate water is exposed to intense radiation to provide continuous bacterial control by photo oxidation and cleavage of organic molecules.

Ion-Exchange Cartridge – removes dissolved ionic particles.

Purified water is passed through the following sensors to display water quality and temperature:

Water Quality Sensor – measures the resistivity of the water

Temperature Sensor – Provides accurate temperature measurement.

Purified water is stored in a reservoir for dispensing and use.

WATER PURITY SPECIFICATIONS

PURITY	SPECIFICATION
Inorganic	1 to 5 M /mm
Total organic carbon	<20 ppb
Bacteria	<1 CFU/ml
pH	Neutral

INSTALLATION & START UP

Refer to Operations Manual for installation and startup instructions.

Once equipment is installed and in working order, it is left on. During periods of non-use the unit will automatically operate in intermittent recirculation mode to maintain water purity.

Title: OPERATION AND MAINTENANCE OF ELGA™ WATER DISTILLATION UNIT**CONTROL PANEL DISPLAYS (Operations Manual, Page 10)**

Control panel displays are controlled by left and right control buttons. See display of icons on page 10 of Operations Manual.

MAINTENANCE

ITEM/PROCEDURE	PART#	REPLACEMENT FREQUENCY
Pre-treatment cartridge	LC140	Replace every 6 months.
Ion-exchange cartridge	LC141	Replace every 6 months or when the water purity alarm indicates need to change.
UV Lamp	LC105	Replace annually or if “lamp fail” alarm occurs.
Reverse Osmosis cartridge	LC143	Replace every 2-3 years. *
Inlet Strainer	NA	Clean every 6 months; replace if damaged.
Re-Circulation Strainer	NA	Clean every 6 months.
Sanitization of Unit and Reservoir	CT1 (Tablet)	Perform monthly.

* Not an operator installation procedure; must be replaced by trained service representative.

REPLACING PRETREATMENT CARTRIDGE (Operations Manual, Page 24)

Remove old cartridge as follows:

1. Switch unit off at the power switch at the top left hand side of the unit.
2. Open the dispensing tap to relieve residual pressure from the system.
3. Open front door and identify the pretreatment cartridge (see Diagram in Operations Manual, page 24).
4. Remove the reducing fitting from the elbow at the bottom of the cartridge by pushing back the retaining collet on the push fit connector and withdrawing the reducer.
5. Remove the reducing fitting from the elbow at the top of the cartridge.
6. Remove exhausted cartridge from retaining clips.
7. Discard in non-hazardous waste.

Insert new cartridge:

1. Unpack the new cartridge and remove the 2 protective transit plugs sealing the inlet and outlet connections.

KCMC Biotechnology Laboratory	STANDARD OPERATING PROCEDURE	Effective Date	SOP-Number EQP.011
		Page 5 of 9	Date DRAFT
Title: OPERATION AND MAINTENANCE OF ELGA™ WATER DISTILLATION UNIT			

2. Secure the new cartridge into its retaining clips and make sure the cartridge is the right way up.
3. Refit the inlet tubing into the bottom of the cartridge by pushing the reducer into the elbow connector until locked and held by the retaining collet.
4. Refit the outlet tubing to the top of the cartridge in the same manner.
5. Reset the pretreatment cartridge timer (see instructions below).
6. Press the PROCESS button to restart the unit.

REPLACING ION-EXCHANGE CARTRIDGE PACK (Operations Manual, Page 25)

Remove old cartridge as follows:

1. Switch power off.
2. Open the dispense tap to relieve any residual pressure from the system.
3. Open the front door.
4. Push on cartridge top cap, lift up cartridge and slide it out.
5. Discard cartridge in non-hazardous waste.

Insert new cartridge:

1. Unpack the new cartridge and remove the 2 protective plugs sealing the inlet and outlet ports.
2. Wet the "O" rings and slide new cartridge into position.
3. Position cartridge into spigots and push into unit.
4. Ensure the guide has dropped down past retainer.
5. Close the front door.
6. Reset the ion-exchange cartridge timer (see instructions below).
7. Press the PROCESS button to restart the unit.

REPLACING UV LAMP (Operations Manual, page 26)

Remove old UV lamp:

1. Switch off the electrical supply at the main plug.
2. Disconnect the mains plug from the unit.
3. Open the dispense tap to relieve any residual pressure from the system.
4. Open the front door panel.
5. Pull the UV unit out of the top and bottom retaining clips.
6. Remove top and bottom spring clip.
7. Unplug the white lamp plugs fitted to the top and bottom of the UV unit.

Title: OPERATION AND MAINTENANCE OF ELGA™ WATER DISTILLATION UNIT

Caution: Hold on to the pins on the lamp in case the lamp falls out and breaks.

8. Remove old UV lamp from the center bore of the housing.
9. Discard lamp in non-hazardous waste.

Insert new lamp:

1. Unpack new lamp.
2. Use a soft cloth to handle the lamp. DO NOT TOUCH SURFACE OF THE GLASS.
3. Wipe surface with alcohol before inserting into the housing.
4. Slide the new lamp into the center bore of the UV housing.
5. Plug the white lamp plug into the bottom of the UV unit.
6. Refit the spring clip.
7. Plug the white lamp plug into the top of the UV unit.
8. Refit the spring clip.
9. Push UV unit into the retaining clips.
10. Close the front door.
11. Reattach the mains plug and reconnect to main power supply.
12. Reset the UV alarm settings (see instructions below).
13. Press the PROCESS button to restart the unit.

RESETTING SYSTEM ALARM SETTINGS (Operations Manual, Page 17)

Alarms must be reset after replacement of pre-treatment and ion-exchange cartridges and UV lamp.

1. Turn the unit off at the power inlet module.
2. Enter the replacement timer set up by pressing the left hand touch pad button and at the same time turn the power on.
3. A graphic of each of the items will display (see diagram, page 17).
4. The ion-exchange cartridge is represented by the DI graphic. Press the ✓ to reset the timer. To abort the reset, press the X symbol.
5. Press the ✓ to go to the next item. If you wish to return to the previous item, press the reverse arrow symbol.
6. Follow steps 4 and 5 to reset the timers on the UV lamp and pre-treatment cartridges.

KCMC Biotechnology Laboratory	STANDARD OPERATING PROCEDURE	Effective Date	SOP-Number EQP.011
		Page 7 of 9	Date DRAFT
Title: OPERATION AND MAINTENANCE OF ELGA™ WATER DISTILLATION UNIT			

CLEANING INLET STRAINER (Operations Manual, page 27)

1. Switch off electrical supply.
2. Open front door and isolate the inlet water supply.
3. Remove the pre-treatment cartridge from its clips and set aside to gain access to the inlet strainer.
4. Depress the collars on both sides of the strainer and disconnect tubing.
5. Hold the inlet strainer over a sink or receptacle (beaker).
6. Unscrew the inlet strainer and remove the mesh filter. Note the position of the filter as it will have to be reinserted facing the same way.
7. Check filter for wear or damage and replace if necessary.
8. Flush filter to remove any accumulated material.
9. Reinsert filter into strainer and make sure it is facing the right direction.
10. Screw up the inlet strainer and reposition.
11. Refit tubes to the inlet strainer and make sure it is facing the correct direction (see diagram).
12. Reposition the pre-treatment cartridge into its support clips.
13. Reestablish the inlet water supply.
14. Turn on power.

CLEANING RE-CIRCULATION STRAINER (Operations Manual, page 28)

1. Open front door and isolate inlet water to the re-circulation strainer..
2. Remove the ion-exchange cartridge from its clips and set aside to gain access to the inlet strainer.
3. Depress the collars on both sides of the strainer and disconnect tubing.
4. Hold the re-circulation strainer over a sink or receptacle (beaker).
5. Unscrew the strainer and remove the mesh filter. Note the position of the filter as it will have to be reinserted facing the same way.
6. Check filter for wear or damage and replace if necessary.
7. Flush filter to remove any accumulated material.
8. Reinsert filter into strainer and make sure it is facing the right direction.
9. Screw up the re-circulation strainer and reposition.
10. Refit tubes to the strainer and make sure it is facing the correct direction (see diagram).
11. Reposition the ion-exchange cartridge into its support clips.
12. Reestablish the inlet water supply.

KCMC Biotechnology Laboratory	STANDARD OPERATING PROCEDURE	Effective Date	SOP-Number EQP.011
		Page 8 of 9	Date DRAFT
Title: OPERATION AND MAINTENANCE OF ELGA™ WATER DISTILLATION UNIT			

13. Turn on power.

SANITIZATION PROCEDURES

Sanitization of the unit and the reservoir removes bacteria within the reservoir, pipework and the filters of the unit.

Materials:

CT1 Tablet*

** CT1-tablet contains sodium dichloroisocyanurate dehydrate which is toxic by inhalation, ingestion and skin contact.*

Handling Instructions:

1. Keep container tightly closed in a dry place.
2. Wear protective clothing (lab coat and gloves) when handling.
3. If tablets are spilled and dry, place in heavy-duty plastic bag. Discard with hazardous waste. Flush away any residues with copious amounts of water.

First Aid:

1. Eyes – thoroughly wash out with clean water for 15 minutes and seek medical advice.
2. Inhalation – Remove from exposure and expose to fresh air. In extreme cases seek medical attention for acute chlorine poisoning.
3. Skin – Drench skin with plenty of water. Remove contaminated clothing and wash before reuse. In severe cases seek medical attention.
4. Mouth – Wash out mouth thoroughly and drink large quantity of milk.

SANITIZATION OF UNIT AND RESERVOIR (Operations Manual, Page 31)

Perform these procedures toward the end of the day as water will not be available until overnight flushing is complete.

Sanitization:

1. Ensure that the reservoir level indicator reads >40%. If display shows >70 or 100%, dispense water until display changes to >40%.
2. Press the PROCESS button to stop the process.
3. Turn off the electrical supply.
4. Relieve residual pressure by opening the tap and draining.
5. Close dispense cap.
6. Unscrew cap on sanitization port (top left side).
7. Insert 1 CT1 cleaning tablet into sanitization port and refit the cap..
8. Unscrew cap on sanitization by-pass block.

KCMC Biotechnology Laboratory	STANDARD OPERATING PROCEDURE	Effective Date	SOP-Number EQP.011
		Page 9 of 9	Date DRAFT
Title: OPERATION AMD MAINTENANCE OF ELGA ™ WATER DISTILLATION UNIT			

9. Insert CT1 tablet and replace cap..
10. Open front door and remove ion-exchange cartridge. Set aside.
11. Wet O rings on by-pass block.
12. Slide by-pass block into unit and lock securely in place.
13. Restore power, press the PROCESS button to start the sanitization process for 60 minutes.
14. After 60 minutes press the PROCESS button to stop the sanitization process.

System Flushing:

1. Switch off electrical supply.
2. Discard the majority of the reservoir contents.
3. Disconnect the outlet tube at the reservoir inlet and direct to drain.
4. Restore power supply.
5. Press the PROCESS button to start system flushing. The system will operate automatically during flushing and it is recommended the system be flushed overnight.
6. Press the PROCESS button to stop the system flushing.
7. Shut off power supply.
8. Remove the by-pass block by pushing and tilting upwards.
9. Slide by-pass block out of unit and store.
10. Reinsert ion-exchange cartridge and lock securely into place.
11. Close front door.
12. Turn on power.
13. Reconnect the outlet tube to the reservoir.
14. Press the PROCESS button to return to normal operation.
15. Check system for leaks.

REFERENCE:

Operator Manual, ELGA PURELAB Option-R 1/15, October 2001.

APPENDIX A – ELGA Water Distillation System Maintenance Log