



MANITOBA RENAL PROGRAM

SUBJECT <ul style="list-style-type: none"> ▪ Use of Lauer Aquaboss Eco RO Dia 70 Reverse Osmosis System 	SECTION 30.30 Water Treatment
	CODE 30.30.03
AUTHORIZATION <ul style="list-style-type: none"> ▪ Professional Advisory Committee, Manitoba Renal Program ▪ Nursing Leadership Council, St. Boniface General Hospital 	EFFECTIVE DATE December 2007
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PURPOSE:

1. To provide instructions to hemodialysis Nurses, Technologists, Unit Assistants, Health Care Aides, Nursing Assistants and Home Hemodialysis patients for the use and disinfection of the portable Aquaboss Reverse Osmosis (RO) system.

POLICY:

1. Nurses, Technologists, Unit Assistants, Health Care Aides, Nursing Assistants and Home Hemodialysis patients who have received instruction and have demonstrated competency to the renal educator or delegate may use the Lauer Aquaboss RO system.
2. Disinfection of the Aquaboss RO System must be performed monthly.
3. Disinfection of the Aquaboss RO system must be performed prior to treatment if it has not been in use for greater than 72 hours.

EQUIPMENT:

- Lauer Aquaboss portable RO system
- Disinfectant – Dialox®
- Residual test strips – hydrogen peroxide
- 60 mL syringe
- 10 mL syringe
- High Quality Water (HQW) Sample Connector
- Single Patient Hemodialysis Delivery Systems
- Gloves
- Goggles
- Container/bucket
- Tempered water supply (25°C)

WARNING! Dialox® can cause irritation and damage to eyes, skin and the respiratory system. Always wear protective eyewear and gloves, and ensure adequate ventilation.

PROCEDURE:

A. Start Up:

1. Connect RO to appropriate water and electrical supply.
2. Ensure water supply tap to RO is open.
3. Turn Main Power Switch (green) on RO to ON

B. Normal Operation:

1. Start up RO if not already on.
2. Determine current operating mode of RO as indicated on 2nd line of display.
3. If the display shows "OPERATION", the RO is ready to use for dialysis once the pre-flushing is complete.
4. If not in OPERATION mode, press the button under the "ON" selection. Confirm that the 2nd line of the display reads "OPERATION".

C. Disinfection:

1. **Important:** Disconnect the RO HQW output from the dialysis machine.
2. Start up RO, if not already on.
3. Determine current operating mode on the 2nd line of display. If in "OPERATION", select the "OFF" option by pressing the button under that selection.
4. Select the "C&D" option by pressing the button under that selection.
5. Press "D" for disinfection.
6. Press and hold the "5 sec" button until the disinfection is initiated.

KEY POINT:

- RO will run through various start-up tests (1 minute).
- The 2nd line in the display will then show the current operating mode. This will be the same mode the RO was in when it was turned off.
- See Start Up section.
- Normally this would be SYSTEM OFF.
- The RO will run through 3 phases initially, as indicated in the 3rd line of the display:
 - 1) Empty Tank
 - 2) Fill Tank
 - 3) Preflushing (approximately 5 minutes)
- The 3rd line of the display will show HQW conductivity and RR (rejection ratio) once the preflushing is complete.
- Once the PREFLUSHING is complete the RO will be producing High Quality Water (HQW) for the dialysis machine.
- See Key Point above.
- The dialysis machine SHOULD NOT be turned on until the PREFLUSHING is complete.
- Disinfectant can be drawn up by the dialysis machine if left connected to the RO.
- See Start Up section.
- C&D option (Clean and Disinfect) is not available when the RO is in OPERATION mode.
- The disinfection will proceed through several short phases.

PROCEDURE:

7. When the display reads "Fill in Disinfect", add 60 mL of disinfectant through the Luer lock disinfection port.
 - a. Draw 60 mL of disinfectant into a syringe.
 - b. Remove luer lock cap from disinfection port.
 - c. Attach the syringe to the disinfection port and slowly inject the full 60 mL of disinfectant into the disinfection port.
 - d. Remove syringe and discard.
8. Press the button under the "→" selection to continue the disinfection process.
9. When the RO alarms momentarily and the display reads "Check UP for Residual DI".
 - a. Connect sample connector to HQW connector.
 - b. Run water to a container for 1 minute, before testing.
 - c. Test output for residual disinfectant using the appropriate test strips.
 - d. Disconnect sample connector.
 - e. Also test RO drain water for residual disinfect.
10. Once "FLUSHING" is complete, the display will read "Check UP for Residual DI?" only.
 - a. Confirm the results of your residual test.
 - b. Select "Yes (5 sec)", hold for 5 seconds, if a NEGATIVE residual result was obtained.
 - c. Select "NO" if a POSITIVE residual result was obtained.
11. Press the button under the "→" selection to confirm completion of the disinfection process.

KEY POINT:

- Use gloves and eye protection when handling disinfectant.
- The RO is now in the recirc. phase (5 minutes). The internal conductivity must reach 120 uS in order for the disinfection to continue. If not reached, the RO will return to Step 7 for more disinfectant.
- The 2 remaining phases (dwell 20 minutes and flush 30 minutes) will continue. (This will include the stopping and starting of the internal pump.) The remaining time of each phase is shown on the display in seconds.
- After 15 minutes of the flush phase the RO will alarm and display that a residual check can be performed.
- Use container to catch sampling water.
- You have approximately 15 minutes while the RO continues its rinse to test the water at the HQW connector and drain line sample port until a negative residual disinfectant result is obtained.
- If drain line sample port present, use 10 mL syringe to draw sample. Flush sample port with drain water 3 times using a syringe before testing.
- A "NO" selection will initiate a further 30 minute rinse during which further samples can be taken for residual testing.
- The "ESC" key can be selected to cancel the remaining rinse time if desired.
- Exits the disinfection mode.
- RO will begin to enter into Standby mode (5 minutes).

PROCEDURE:

12. Reconnect the RO HQW connector to the dialysis machine.
13. Press “ON” button
Select “OFF” to shutdown the RO, if desired.

KEY POINT:

- RO is now in “Normal Operation”.
- See RO “System Shutdown” section.

D. RO System Shutdown:

1. Press the button under the “OFF” selection.
2. Turn “OFF” main power switch (green).
3. Turn “OFF” water supply tap.

- The RO will move through 2 phases (approximately 3 minutes) after which the power can be turned off.
 - Tank Filling,
 - Tank Emptying

E. Reset Filter Check Timer:

1. Select “Menu” option from display.
2. Use “↓” button to scroll to #1 “Timer Reset”, press “Enter”.
3. Use “↓” button to scroll to 1.1 “PreFilter Change”, press “Enter”.
4. Press “Reset”.
5. Press “ESC” 3 times to return to main page on display.

- Resets timer for filter change reminder.
- Date will reset to current date.

F. Standby:

1. The RO is in standby if the 2nd line of the display reads “Standby”.
2. Select any of the other Operating Modes if desired.

- Standby is used to conserve water when HQW is not required, but automatically allows for intermittent internal flushing to prevent stagnation.
- Standby has 3 phases:
 - Rinsing
 - Break
 - Interim flushing
- ON, C&D and OFF modes are available at the bottom of the display.

TROUBLESHOOTING:

1. The AquaBoss has two types of numbered fault messages:

KEY POINT:

TROUBLESHOOTING:

- a. **Alarms** – Alarms indicate a parameter has deviated from the allowable range. The alarm notifies the operator and the RO remains operational. The alarm will automatically reset once the parameter is back in normal range.
- b. **Errors** – Errors indicate a non recoverable fault. The RO will not continue to work. The RO must be turned OFF/ON with the Main Power Switch in order to reset the error fault.

KEY POINT:

- Red LED blinks.
- Green LED blinks.
- Audible alarm sounds once.

- Red LED blinks.
- Green LED off.
- Intermittent audible alarm.

COMMON FAULTS:

1. **ALARM 19**
No water, on start up.
2. **ERROR 6**
RO waste water temperature greater than 37° C during operation.
3. **ERROR 25**
RO water temperature less than 10° C.
4. **ERROR 26**
HQW temperature greater than 37° C during start up test.
5. **ALARM 7**
No water
6. For all other ERROR/ ALARM codes, call the technologist for assistance.

POSSIBLE SOLUTIONS

- Turn on water supply to RO.
- Low water pressure, check pre-filters.

- Check pre RO temperature.
- Set temperature mix valve to 25° C.

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REFERENCES:

Manufacturer's information, Lauer Aquaboss Eco RO Dia 70 Operator Manual (rev4.5 May01/06) and ECO 70 Quick Reference Guide (rev E 2009/12).