



**NEPHROLOGY PROGRAM
DEPARTMENT POLICIES AND PROCEDURES**

**Hemodialysis - Section 14 - Unit Specific - QCH Neph 14-01
Water Treatment Management
No.: 01377 (TOH Standardized Policy Number)**

ISSUED BY:

Hemodialysis Clinical Practice Committee

DATE OF APPROVAL:

N/A

APPROVED BY:

Program Clinical Director & Division Head

LAST REVIEW/REVISION DATE:

2017/11

CATEGORY:

Unit Specific – Satellite Unit (QCH)

IMPLEMENTATION DATE:

2013/12

POLICY STATEMENT:

- To verify (daily) the feed water pre-treatment and Reverse Osmosis are functioning and producing water within CSA/ISO water standards for hemodialysis

BACKGROUND STATEMENT:

- The QCH Hemodialysis Satellite Unit Nursing staff is responsible for completing the required chloramines test and visual checks as per procedure below – section A (every day) before Hemodialysis treatments can be performed
- The Nephrology Biomedical Technical Services team oversees all water treatment operations
- The Reverse Osmosis is on a timer and will start at 06:00 AM and stop at 20:00 Monday through Saturday
- The auto disinfect program will commence at 21:00 Monday through Saturday and 09:00 AM on Sunday
- In order for all of the auto program timers to function correctly the Reverse Osmosis Unit shall be left in “Night Mode”. If for any reason the main power switch must be turned off or there is a power failure, upon re-starting, the “night” mode button needs to be selected. If Hemodialysis treatments are still taking place then the “dial” button for dialysis mode should be selected immediately after selecting “night” mode
- The Reverse Osmosis will perform periodic auto flushes every 90 minutes when it is not in “Dialysis” mode
- The four carbon tanks will perform a backwash for 15 minutes each night running consecutively starting at 03:30

- The two water softeners will automatically perform a regeneration process when they become exhausted. One at 23:30 and the other at 01:30 AM
- If dialysis is required outside of the normal operating hours, the on call technologist must be called to disengage the auto timer and ensure a disinfection is not taking place
- All gauges are lettered and need to be read in *psi*
- Temperature is to be read in degrees Celsius
- All valves are numbered
- Any abnormal conditions or variances with section A of this procedure shall be reported to the Nephrology Biomedical Technical Services team

SUPPLIES:

- 1 Bottle Hi Sense Chloramine Test Strips(Dated when opened)
- 1 Bottle Reagent Solution
- 1 Sample Cup
- 1 clean syringe
- QCH Pre-treatment and Reverse Osmosis Daily Log

DEFINITION(S): N/A

ALERTS:

HiSense Test Strips/Reagent Solution:

- Do not allow the test strip to come in contact with liquids or with work surfaces which may be contaminated with interfering substances
- Do not use the test materials in areas where vapours from containers of bleach or other oxidizing solutions may be present
- Do not touch the reagent-containing Paper Flap on the test strip
- Keep the test strips in their original bottle
- Replace the cap on the test strip bottle immediately and tightly after removing a strip; the strips must be protected from humidity and heat
- Do not use the Test strips/Reagent Solution after their expiry dates written on the bottles. The Serim Hisense test strips are to be used within 3 months after first opening the bottle. The expiry date will be verified on the bottle and the date opened will be written in the space provided on the bottle label

PROCEDURE:

Section A: Completing and verifying the pre-treatment and reverse osmosis water daily log sheet

1. Read Gauge E. This is the water pressure coming into the dialysis unit, ensure it is > than 30 *psi*
2. Read Gauge E. Verify temperature gauge post blending valve, temperature should be between 10-24°C.(written in red on gauge)
3. Read Gauge N and O, record the readings. Record the delta pressure by subtracting the reading from gauge N from gauge O (N-O=delta pressure). If the delta pressure is >10psi notify a Technologist immediately

4. Record the rejection rate located on the front panel of the RO. Should be >97%. If the Rejection is 4% to 5% lower than the previous days recorded values notify a Technologist immediately
5. Record the conductivity located on the front panel of the RO. The conductivity should be between 0-7 us/cm. If the conductivity increases by more than 4 us/cm than the previous days reordered values than notify a Technologist immediately
6. Test the carbon filters for presence of chlorine/chloramines using the Hisense test strips:
 - To test for the presence of chloramines, obtain a water sample from the sample port at test point 1-1 & 1-2. Run the water for 5 seconds. Fill the drinking cup x 2 and discard. The third sample will be tested for Chloramines
 - Refer to Nursing Alert (see below) for specific details regarding the Test/Reagent Solution. Check for expiry date on the test strip bottle. Remove one test strip from the bottle. Replace the lid promptly and tightly
 - Insert the test strip in the strip holder (with the paper facing up) until it meets the peg stop. Snap the strip holder closed
 - Remove a water sample from the medicine cup using a clean syringe. Add the water sample drop-wise into the reservoir on the top of the test strip holder until the reservoir is just full (do not overfill)
 - Immediately add **1 drop** of Reagent Solution to the sample in the reservoir.
Note: the addition of more than 2 drops of Reagent Solution will adversely affect the sensitivity of the test
 - When the water sample has drained from the reservoir (approximately 5 minutes), remove the strip from the holder and interpret the results

Note: Do not interpret if more than 5 minutes has elapsed as it might become blue related to chlorine in the air

Interpretation:

1. If the circular Reaction Zone displays a distinct blue colour, darker than the surrounding paper flap, record as positive. If either 1-1 or 1-2 are positive you must re-test at chloramines test points 2-1 & 2-2
2. If either sample from chloramines test points 2-1 or 2-2 is positive the water should not be used to prepare the dialysate. If the test is positive, it means that the water is over the CSA/ISO standard of 0.1ppm and therefore may cause hemolysis. Nephrology Biomedical Technical Services and Clinical Manager need to be notified immediately
3. If the sample from test port 1-1 or 1-2 is positive and second test ports 2-1 and 2-2 are both negative, then Dialysate can be prepared but Nephrology Biomedical Technical Services needs to be immediately notified immediately
4. If the circular Reaction Zone is no darker that the rest of the paper flap, record as negative. The water has less than 0.1 ppm total chloramines and is considered safe for dialysis
5. Record the results of the chloramines test on the Water Daily log (Appendix A pg.7)

Section B: RO troubleshooting tips

Morning Start Up:

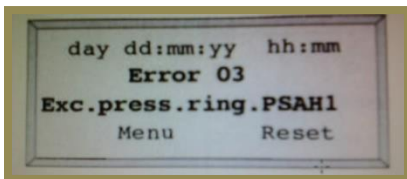
- If the RO is in an alarm state check the Hot Rinse control box and turn off the main power switch if it is alarming too. You can leave it off and the Technologists will take care of it or they may instruct you to turn it back on once the RO Unit starts back up and runs normally again
- Read the error code on the Main RO control box and write it down and verify what it says in the manual

Error 16:

- Leakage Alarm: if you have this alarm in the morning you are required to check behind all Artis machines, concentrate room (rinse sink) and the Technical Lab for any water leaks
- If there are any leaks you will have to find the source and correct it or you may cause a flood. If the leak appears to be coming from a hemodialysis machine, disconnect the “quick connect” water line and replace with a spare machine
- If there are no leaks, restart the RO Unit by turning off the main power switch for 10 seconds and then turning it back on. The RO Unit may take 3-5 minutes to perform its functional tests

Alarms during Treatments or Morning Start Up RESETABLE ERROR CODES:

- Some Errors will give you an option to RESET the RO Unit. Simply press the “F” Button that corresponds to where the RESET is shown on the display. The RO Unit will take 3-5 minutes to perform its functional tests. When prompted select “F3” (DIAL) to restart the RO for dialysis. If the alarm re-occurs call a Technologist

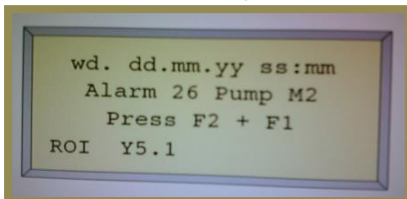


The 4 “F” buttons are directly below the display

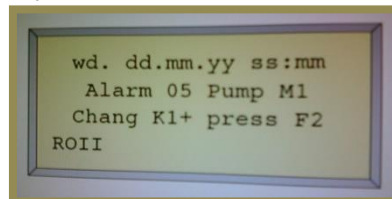
F1 F2 F3 F4

Emergency operation:

- There are 2 Error code functions that will allow the RO Unit to run in “Emergency Operation mode”: alarm 26(RO1) or alarm 05 (RO II)
- For alarm 05 (RO II) only, you will be asked to open K1 valve first. Be sure not to miss this step or the RO will try to run without water



F1 F2 F3 F4



K1 valve pull out, than push up

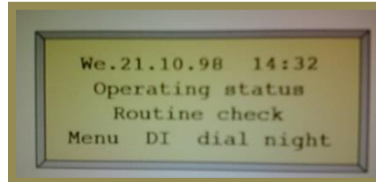


All other error codes:

For all other error codes that do not prompt you with a RESET or Function:

- You will need to turn off the main power switch for 10 sec and turn it back on. The RO may take 3-5 minutes to perform its functional tests.
- If you are prompted with this window below during the start-up, push the F3 button to activate "DIAL" for dialysis operation.

F1 F2 F3 F4



- If the RO Unit re-starts without any alarms your display will look similar to the image below and you can proceed with treatments or complete the water check list if applicable.



- If the RO Unit re-starts with Alarms you will need call a Technologist. Be sure to inform them that you will have to return blood to all patients, so they aware of the urgency
- There are other alarms which may cause a short beep on the remote panel. They reset on their own. Please notify a Technologist so he can look into and correct the problem

RELATED POLICIES / LEGISLATION: N/A

REFERENCES:

1. Aquaboss Reverse Osmosis, (ECO) RO Dia IC/IIC Operating Instructions
2. Nephrology Biomedical Technical Services team
3. CSA-ISO 13959-15 *Water for haemodialysis and related therapies*
4. CSA-ISO 26722-16 *Water treatment equipment for haemodialysis applications and related therapies*
5. Serim, HiSense Test Strips, Product information insert

COMMENTS / SIGNIFICANT REVISIONS: N/A

