The Ottawa Hospital | L'Hôpital d'Ottawa

NEPHROLOGY PROGRAM
DEPARTMENT POLICIES AND PROCEDURES

Hemodialysis - Section 14 - Unit Specific - CCH Neph 14-23
Troubleshooting Gambro Water Treatment
No.: 01367 (TOH Standardized Policy Number)

ISSUED BY:
Hemodialysis Clinical Practice Committee

DATE OF APPROVAL:
2014/10

APPROVED BY:
Program Clinical Director & Division Head

LAST REVIEW/REVISION DATE:
2017/11

CATEGORY:
Unit Specific – Satellite Unit (CCH)

IMPLEMENTATION DATE:
2014/06

POLICY STATEMENT:

- To guide the user in the correct actions for troubleshooting the Gambro Reverse Osmosis (RO) units

BACKGROUND STATEMENT:

- Continue treatment in bypass (ultrafiltration occurs, diffusion does not occur)
- 'Dialysis temperature high' alarms may occur on the Artis machines. The machines will be in bypass so there is no chance of harm to the patient
- Discontinue dialysis if water is not restored within 30 minutes
- Notify Nephrology Biomedical Technical Services team of system malfunction
- Notify Nephrologist and Clinical Manager to triage patients

DEFINITION(S):

<u>Alarms</u>

- When an alarm occurs on the Gambro RO units, the A or B alarm lamp on the external lamp indication unit will start to flash. In case of an A alarm, the buzzer will also sound
  - **Alarm A:** is a condition that requires prompt operator response. It will prevent the RO from running. Contact a Technologist
  - **Alarm B:** is a warning alarm for something that is not ideal but the RO will continue to run. Operator awareness is required. Contact a Technologist as needed

- Refer to Appendix A (pg. 5) for the list of alarms and information signals
- Notify the Nephrology Biomedical Technical Services team at the Riverside campus at (613) 738-8400 ext. 82832 or 82825. If after 18 :30 contact the Technologist on call at (613) 759-9229. Notify Clinical Manager as needed

ALERTS: N/A

PROCEDURE:

Section A: Alarm information

1. **Power Failure:** In case of power failure, the RO unit stops and the display turns blank. All relevant data is retained in the memory

    a. If this occurs during operation the unit restarts automatically and returns to operation after 45 seconds (does a conductivity check) when the power returns

2. Water Supply Interruption:

    a. During operation—the unit stops and issues a 1. Low level inlet alarm. The unit makes up to 4 attempts to restart with one minute intervals.

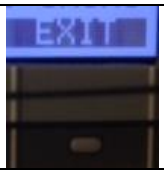
        - Restart successful—The alarm remains in the alarm list and must be reset manually

        - Restart not successful—Notify a technologist before proceeding. The technologist may have you manually restart the RO units after resetting the alarm

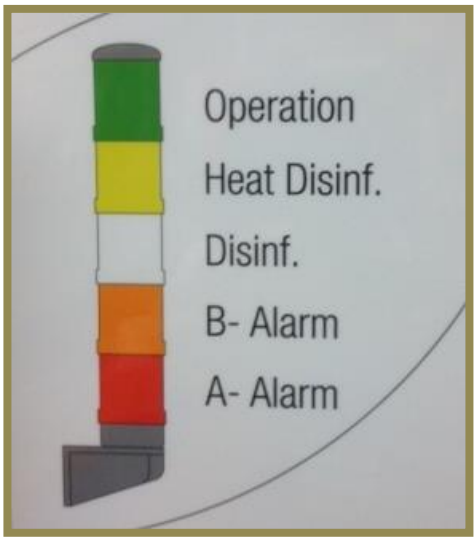
    b. During chemical disinfect—no alarm is issued. Low level appears on the display. The RO units will try to start at pre-programmed intervals (30 minutes)

Section B: ACTIONS IN CASE OF ALARMS

1	**In the dialysis unit and technical lab:** silence the audible alarm by pressing the green "mute" on the bottom section of the RO panels. Note if the alarm is for RO1 or RO2	
2	**On RO1 or RO2:** Press the "ALARM" button. A list of alarms that have occurred will be displayed with the latest alarm at the top of the list --For an alarm that has not yet been acknowledged you will see this symbol "*****"	
3	**Take note of the alarm:** and write on the Water Treatment Room Daily Checks Sheet with date, time and your initials. ***Note: Call technologist as needed***	
4	**Acknowledge the alarm:** Ensure that the cursor on the alarm list points at the alarm to be acknowledged (***** in front of the alarm). If not move the cursor with the arrow buttons. Then press "ACK"	

5	"*****" will disappear and the alarm light on the external lamp unit goes from flashing to steady light	*****
6	**If the cause still remains:** "-" is shown after acknowledgement	**-**
7	Alarm that is no longer active but has not been acknowledged shows as "$"	**$**
8	**For consecutive alarms:** It is important to acknowledge all alarms. Use the arrow buttons to find all alarms and then acknowledge them	
9	**When the alarms have all been acknowledged and are no longer present:** Press the key corresponding to the word "Exit" on the RO screen to return to the normal display	
10	**If an alarm is still present:** perform the start up procedure of the OSMOSIS that has no alarm, RO1 or RO2 as per policy Neph 14-24 CCH Start-up of Reverse Osmosis Unit not following Chemical Disinfect	

Section C: RO remote panel



3. **Green** light:
    a. **Constant light—**the RO units are in normal operation. This is what you should see when you arrive to the unit in the morning (except the morning following a chemical disinfection)
    b. **Flashing light—**The RO units are not ready for operation
4. **Yellow** light:
    a. **Constant light—**Loop disinfection: the hot water circulation of the distribution loop is in operation
    b. **Flashing light—**Loop disinfection Attention: When initiating hot water circulation of the distribution loop by autostart or manually. This is normally done as pre-scheduled at night

5. **White** light:

    a. **Constant light—**Chemical disinfection in progress

    b. **Flashing light—**Chemical disinfection Attention: Chemical disinfection is finished, but the residual test has not yet been performed and verified by entering the operator's code

6. **Orange** (light red) light:

    a. **Constant light—**B ALARM: Indicates that an information signal has been reset, but the cause of the signal still remains

    b. **Flashing light—**Information signal: Indicates that an information signal has occurred. Refer to Appendix A to address the actions for the information signal identified

7. **Dark Red** light: A ALARM

    a. **Constant light and buzzer sounds—**an alarm has occurred. Refer to Appendix A to address the actions for the information signal identified

    b. **Constant light—**Alarm reset but still active. Refer to Appendix A to address the actions for the information signal identified

DOCUMENTATION:

1. Document all actions related to the water treatment room in the comments & special events section of the Water Treatment Room Daily Checks Sheet.

RELATED POLICIES / LEGISLATION: N/A

REFERENCES:

1. Gambro Osmosis Operator procedures (June 21, 2011)
2. Gambro Operator's Manual for CWP 100, model WRO H/H DP (Rev 06.2012)
3. Nephrology Biomed Technical Services team
4. CSA-ISO 13959-15 *Water for haemodiaysis and related therapies*
5. CSA-ISO 26722-16 *Water treatment equipment for haemodialysis applications and related therapies*

Appendix A

5.5 Alarm and information signal list for the operator

No.	*Display text*	*Type*	*Cause*	*CWP action*	*Operator actions*
1	1.Low level inlet	Alarm	Insufficient water supply.	CWP stops. It then tries to restart (max. 4 times).	Dialysis can be performed if operation is resumed. If not, call for technical assistance.
2	Not used				
3	3.Drain valve error	Alarm	Water saving valve faulty.	CWP stops.	Dialysis cannot continue. Call for technical assistance.
4	4.Dos.connector error	Alarm	Dosing connector incorrectly positioned.	During operation: The CWP stops. During Chemical disinfection: Program goes to completion.	During operation: Open the front door and check that the dosing connector is firmly in the correct position. Dialysis can continue if the alarm is rectified. During/after disinfection: Perform normal actions after chemical disinfection. Dialysis can be performed. Call for technical assistance if the alarm cannot be rectified.
5	5.Warning cond.	Information signal	Product water conductivity exceeds set warning limit.	CWP remains in operation.	Dialysis can be performed. Inform technical personnel.
6	6.High cond	Alarm	Product water conductivity exceeds set high conductivity limit.	CWP flushes to drain. No product water to the distribution loop.	Dialysis cannot continue. Call for technical assistance.
7	7.Motorprotector WRO	Alarm	1. Motor protector for the RO-pump released. 2. Unauthorized use of Fast stepping function.	CWP stops.	Dialysis cannot continue. Call for technical assistance.
8	8.Low flow P5	Alarm	Low product water flow to drain during the rinse phase of the chemical disinfection program.	CWP stops.	Dialysis cannot continue. Call for technical assistance.
9	9.Low level chemicals	Information signal	Level sensor in disinfection container indicates low level.	Disinfection cannot be initiated. If the alarm occurs during disinfection, the program goes to completion.	At initiation of disinfection: Exchange the container with a filled one and restart disinfection. After disinfection: Reset the alarm and continue according to normal routines. Dialysis can be performed.
10	10.Leakage	Alarm	Internal water leak in CWP.	CWP stops.	Dialysis cannot continue until alarm is cleared. Call for technical assistance.

CWP 100, model WRO H/H DP

No.	Display text	Type	Cause	CWP action	Operator actions
11	11.Dis temp. low	Information signal	Low temperature in loop during Hot water circulation in the distribution loop.	CWP remains in operation.	Dialysis can be performed. Inform technical personnel.
12	12.V-test ph1 bef.	Information signal	Phase one of the air gap valve test before chemical disinfection has failed.	CWP stops.	Dialysis cannot be initiated. Call for technical assistance
13	13.V-test ph1 aft.	Alarm	Phase one of the air gap valve test after chemical disinfection has failed.	CWP stops.	Dialysis cannot be initiated. Call for technical assistance.
14	14.Low level HW	Information signal	Low water level in the Hot water tank.	CWP remains in operation.	Dialysis can be performed. Inform technical personnel.
15	15.Motorprotector HW	Alarm	Failure of the Hot water circulation pump.	CWP remains in operation.	Dialysis can be performed. Inform technical personnel.
16	16.Low flow P1	Alarm	Low inlet water flow rate during the rinse phase in the chemical disinfection program.	CWP stops.	Dialysis cannot be initiated. Call for technical assistance.
17	17.Low flow P2	Alarm	Insufficient flow to drain.	CWP stops.	Dialysis cannot be initiated. Call for technical assistance.
18	Not used				
19	19.HW Loop leakage	Alarm	Flow supervision alarm during HW circulation.	CWP stops.	Check for leaks. If no leakage can be observed, reset the alarm. Dialysis can be performed. Call for technical assistance.
20	20.V-test ph2 bef.	Information signal	Phase two of the air gap valve test before chemical disinfection has failed.	CWP stops.	Dialysis cannot be initiated. Call for technical assistance.
21	21.V-test ph3 bef.	Information signal	Phase three ofthe air gap valve test before chemical disinfection has failed.	CWP stops.	Dialysis cannot be initiated. Call for technical assistance.
22	22.V-test ph4 bef.	Information signal	Phase four of the air gap valve test before chemical disinfection has failed.	CWP stops.	Dialysis cannot be initiated. Call for technical assistance.
23	23.V-test ph2 aft.	Alarm	Phase two of the air gap valve test after chemical disinfection has failed.	CWP stops.	Dialysis cannot be initiated. Call for technical assistance.

No.	Display text	Type	Cause	CWP action	Operator actions
24	**24.V-test ph3 aft.**	Alarm	Phase three of the air gap valve test after chemical disinfection has failed.	CWP stops.	Dialysis cannot be initiated. Call for technical assistance.
25	**25.V-test ph4 aft.**	Alarm	Phase four of the air gap valve test after chemical disinfection has failed.	CWP stops.	Dialysis cannot be initiated. Call for technical assistance.
26	**26.Remote control**	Alarm	Error in the remote switch.	CWP stops.	Dialysis cannot be performed. Call for technical assistance.
27	**27.Battery low PLC**	Information signal	Low voltage in back up battery.	CWP remains in operation.	Dialysis can be performed. Inform technical personnel.
28	**28.HW-tank temp error**	Information signal	Error in the temperature measuring circuit for the HW-tank.	CWP remains in operation.	Dialysis can be performed. Inform technical personnel.
29	**29.HW-ret.temp error**	Information signal	Error in the temperature measuring circuit for loop return temperature.	CWP remains in operation.	Dialysis can be performed. Inform technical personnel.
30	**30.WS control error**	Information signal	Error in the Water Saving system.	CWP remains in operation but may stop because of other alarms.	Dialysis can continue as long as the CWP stays in operation. If the CWP stops: Call for technical assistance.
31	**31.Cond. measuring**	Information signal	Error in conductivity circuit during function check.	CWP remains in operation.	Dialysis can be performed. Inform technical personnel.
32-46	Not used				
47	**47.Motorprotector 33:1/33:2** (only for WRO H DP unit)	Alarm	One of the motor protectors for the RO-pumps has released.	CWP remains in operation but with reduced output flow.	Dialysis can continue. Call for technical assistance.