Home HD

NxSTAGE® from FRESENIUS MEDICAL CARE

NxSTEPS®

versi® HD

Reference Guide



Disclaimer

NxStage has prepared this document as a supplement to existing labeling and training materials. It is not intended to replace the NxStage System One, VersiHD, or PureFlow SL user guides or the cartridge instructions for use.

Patients, care partners, and providers must review and refer to the VersiHD and PureFlow SL user guides and cartridge instructions for use for all instructions, warnings, and precautions.

CAUTION: Federal law restricts this device to sale by or on the order of a physician.

Contents

Chapter 1: How do I determine my treatment dose? 5

Treatment overview 6

Your pre-treatment assessment 8

Determining your ultrafiltration rate and volume 9

Obtaining an accurate weight 9

Your medications 10

Chapter 2: How do I enter the treatment information? 11

Introduction 12

Entering the treatment parameters 13

Chapter 3: How do I use the VersiHD cycler? 15

Installing the equipment 16

Changing the language displayed by the cycler 16

Preparing for treatment 19

Completing the prime and alarms test 21

Making the cartridge connections 27

Performing the treatment 28

Ending the treatment 32

Maintaining the cycler 34

Common procedures 37

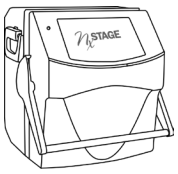
System settings 42

Chapter 4: How do I manage PureFlow SL? 45

Introduction 46

Assembling the PureFlow SL 47

Priming a PAK 51
Making a batch of dialysate 54
Discarding a batch 61
Maintenance 63
Collecting water and dialysate samples 65
Supplemental procedures 69
Chapter 5: How do I troubleshoot common alarms? 73
Introduction: troubleshooting red alarms & yellow cautions 74
Common cycler alarms and cautions at a glance 75
Common PureFlow SL alarms at a glance 79
Standard response for cycler alarms and cautions 80
Responding to cycler air alarms and cautions during TREATMENT mode 81
Monitoring pressure alarms 86
Special conditions 90
Responding to warmer alarms 93
Responding to PureFlow SL alarms and cautions 94
Responding to PureFlow SL alarms during PAK PRIME 95
Responding to PureFlow SL alarms when making a batch 97
Responding to other PureFlow SL alarms 99



Chapter 1: How do I determine my treatment dose?

Chapter Overview

Treatment overview 6

Your pre-treatment assessment 8

Determining your ultrafiltration rate and volume 9

Obtaining an accurate weight 9

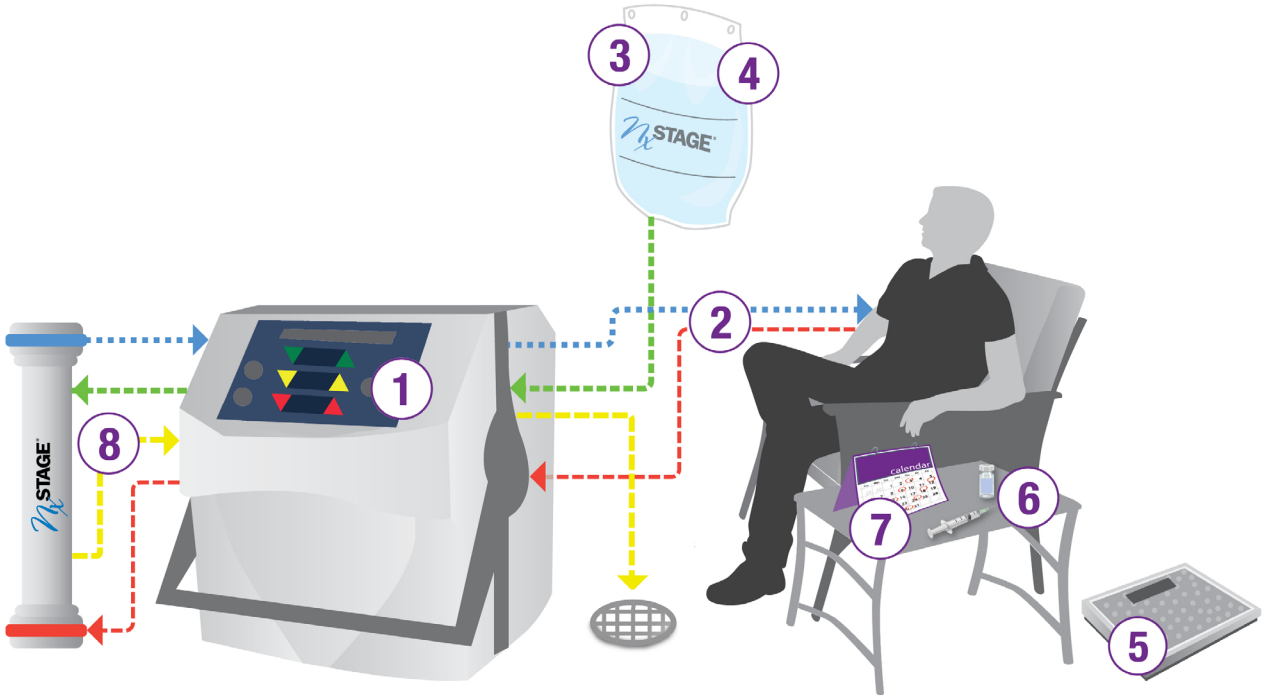
Your medications 10

Treatment overview

Your treatment prescription consists of the following parts:

Prescription Component	Description	Your Prescription
1a Maximum dialysate rate (DFR) in L/hr and maximum ultrafiltration rate (UFR) in L/hr **OR** 1b Maximum flow fraction (FF) % and maximum ultrafiltration rate (UFR) in L/hr	Your ultrafiltration rate and dialysate flow rate control the speed and efficiency of your dialysis therapy. Set either a maximum dialysate flow rate (DFR) **OR** a maximum flow fraction (FF). You do not need to set both.	1a- DFR _____ L/ hr and UFR _____ L/hr **OR** 1b. FF _____ % and UFR _____ L/hr
2 Blood flow rate (BFR)	The rate that blood goes through the blood tubing. Your BFR is prescribed by your physician and is based on your vascular access type. It is best not to exceed 450 mL/min blood flow rate.	_____ mL/min
3 Dialysate volume	The amount of dialysate needed to adequately clean your blood.	_____ Liters
4 Dialysate composition	Dialysate cleans the blood during dialysis. It is a mixture of important electrolytes in water with a specified purity level.	Potassium: _____ mEq/L Lactate: _____ mEq/L
5 Dry weight	This is the weight at which your blood pressure is normal and no swelling exists because all excess fluid has been removed.	_____ Kg

Prescription Component	Description	Your Prescription
6 Heparin dose and/or other medications	A medication that may be prescribed by your doctor that reduces the risk of blood clotting.	_____ units or _____ mL
7 Frequency	More frequent dialysis has been reported to provide significant health benefits for a number of patients.	_____ treatments per week
8 Fluid removal › Ultrafiltration volume (UFV) › Ultrafiltration rate (UFR)	A process that removes excess fluid from the blood. Ultrafiltration removes excess patient weight. Fluid removal is calculated by subtracting your dry weight from your weight just prior to your dialysis treatment. This may change daily based on your weight. UF volume and UF rate will both be determined for each treatment to remove the extra fluid gained.	UF rate _____ L/hr. UF Volume _____ Liters



Your pre-treatment assessment

These guidelines are determined by your dialysis center. If any of the following are true, do not start treatment. Call your dialysis center for instructions.

Vital sign ranges

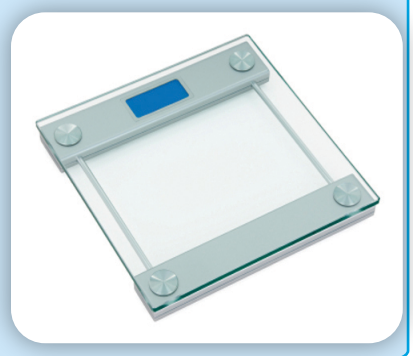
- Your blood pressure is below _____/_____ or above _____/_____.
- Your pulse rate is below _____beats per minute or higher than _____beats per minute.
- Your temperature is higher than _____degrees Celsius or _____degrees Fahrenheit.



Dry weight parameters

- You gain more than _____ Kg between treatments.
- Your weight is _____ Kg below your dry weight.

ⓘ Note: You may adjust your dry weight by _____ Kg per week, but you must call your dialysis center to report your new dry weight target.



Ultrafiltration volume and rate parameters

Make sure that you perform an accurate pre-dialysis assessment. If your volume or rate exceeds the limits below, call your dialysis center prior to treatment for instructions.

- Maximum Ultrafiltration (UF) volume should not exceed _____ Liters.
- Maximum (UF) rate should not exceed _____L/hour.

Determining your ultrafiltration rate and volume

To determine your ultrafiltration volume

- Subtract your current dry weight from your pre treatment weight.
  - This is the total weight to be removed during the treatment.
  - If this ultrafiltration volume exceeds your maximum ultrafiltration volume, call your dialysis center for instructions.

To determine your ultrafiltration rate

Ultrafiltration rate is how much of the fluid volume is removed per hour.

- The ultrafiltration rate should not exceed 10mL/Kg/hr to avoid removing fluid too quickly.
- If this ultrafiltration rate exceeds your maximum ultrafiltration rate, call your dialysis center for instructions.

Example calculation

Pre-weight: **75 Kg**

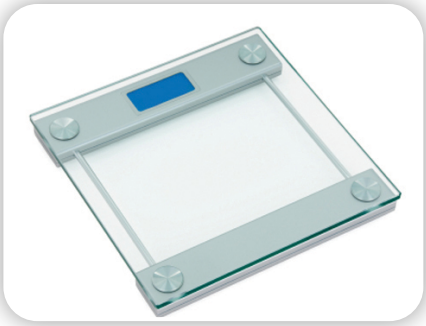
Dry weight: **73 Kg**

Ultrafiltration volume: 2.0 L

Ultrafiltration rate =

.73 L/hour

Obtaining an accurate weight



To get an accurate weight, always do the following:

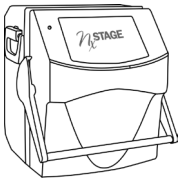
- Weigh yourself just before treatment.
- Use a calibrated digital scale (medical-grade preferred).
- Place the scale on a firm, flat surface (on a bare floor, not on a carpet).
- Weigh yourself wearing clothing of similar weight each day.
- Measure your weight three individual times.
  - Weights should be within 0.1 Kg of each other.
  - Disregard any weight out of this range, then average the remaining weights.

Your medications

As a home hemodialysis patient, you are responsible for giving yourself medications that you currently receive as part of your in-center treatment.

- Record these medications below, along with any other medications you take.
- Your nurse will review these medications with you.

Medication	Purpose	Dose	Frequency (Include time of day)



Chapter 2: How do I enter the treatment information?

Chapter Overview

Introduction 12

Entering the treatment parameters 13

Introduction



The VersiHD control panel is a touchscreen, a display that is also an input device. Tap the buttons on the control panel to set your treatment parameters and make adjustments while monitoring treatment.

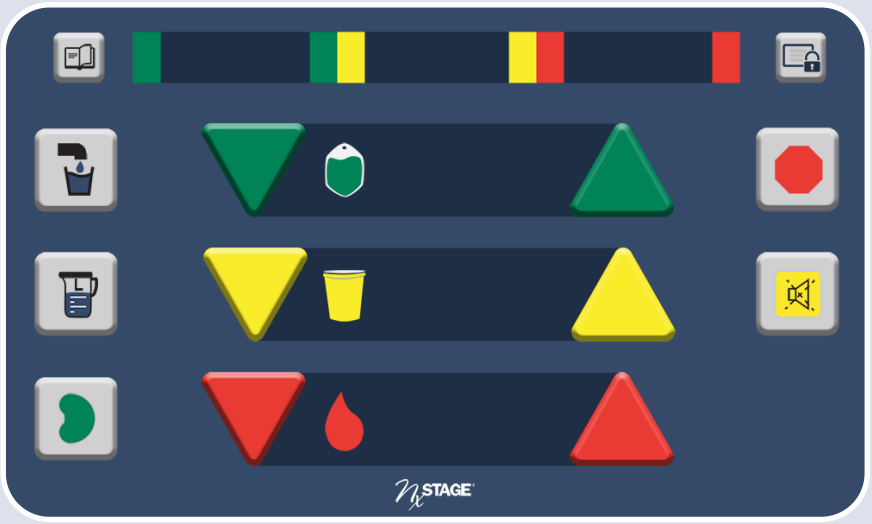
The touchscreen has been updated to include the following improvements:

- Enhanced contrast and brightness of the display and buttons.
- Addition of multiple languages which can be selected by the user.
- A new System Menu button located in the bottom right of the screen.

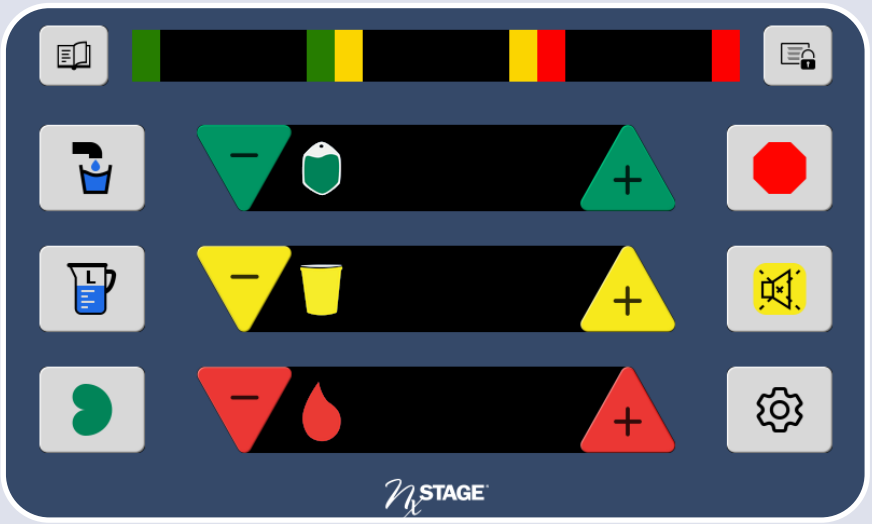
These touchscreen updates do not impact the function of the cycler including how you troubleshoot. For more information please reference the VersiHD User Guide.

As updates to the VersiHD touchscreen are introduced, you may start to see these new display features. This quick reference guide includes instructions for the current and updated VersiHD touchscreen versions.

Current



New



Entering the treatment parameters

Before treatment, enter the treatment parameters on the cycler using the Rate and Volume screens. The Rate screen is the home screen. It is the screen that appears when you turn on the cycler.

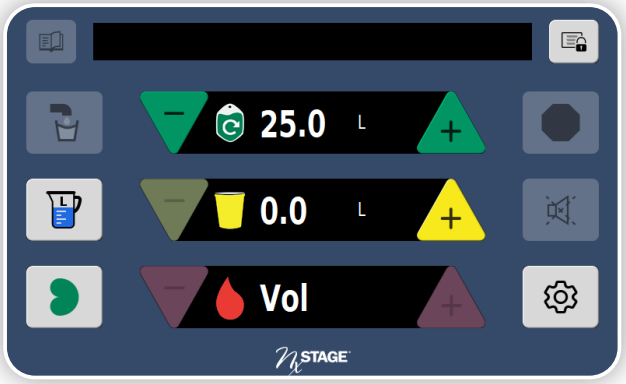
Tapping **VOLUME TOGGLE** switches the cycler to the volume screen. You know you are in the Volume screen because the message **VOL** appears in the bottom (red) status window.

Entering the volume settings on the volume screen

Current



New

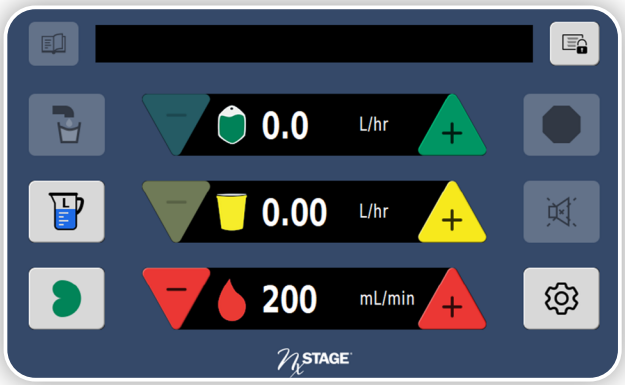


To enter the volume settings, do the following:

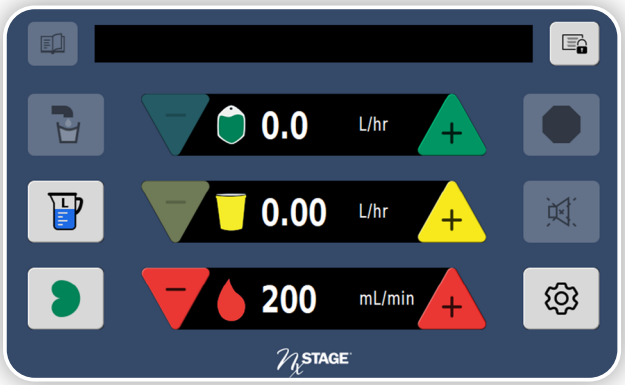
1. On the Rate screen, tap **VOLUME TOGGLE** to switch the cycler display to the Volume screen.
2. Check that the dialysate volume matches the prescription.
3. Tap the green **ADJUSTMENT ARROWS UP** or **DOWN** to make adjustments as needed.
4. Enter ultrafiltration (UF) volume for the treatment by tapping the yellow **ADJUSTMENT ARROW UP**.
5. Tap **VOLUME TOGGLE** to switch back to the rate screen.

Entering the rate settings on the rate screen

Current



New

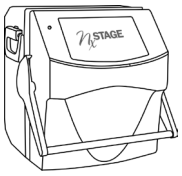


On the rate screen, do the following:

1. Check the blood flow rate.
2. Use the red arrows ADJUSTMENT ARROWS **UP** (+) or **DOWN** (−) to make adjustments as needed.
   - This rate is preset to start at 200 mL/min.
   - After treatment has started, increase the blood flow rate to the prescribed rate.
3. Enter the ultrafiltration (UF) rate you determined by tapping the yellow **ADJUSTMENT ARROW UP** (+).
   - Make sure that the UF fluid is not taken off too quickly.
   - For more information, see “To determine your ultrafiltration rate” on page 9.
4. Adjust the dialysate rate to match the prescription by tapping the green **ADJUSTMENT ARROWS UP** (+) or **DOWN** (−) to make adjustments as needed.

Note: If using dialysate bags, the maximum dialysate rate is 12 L/hr.

After you enter the required parameters and reach your prescribed blood flow rate, the green status window in the upper left corner shows the flow fraction and the total treatment time. If you see a treatment time that doesn’t match the prescription or a treatment time of **99:99**, you have not entered all the required data or you have entered something incorrectly.



Chapter 3: How do I use the VersiHD cycler?

Chapter Overview

Installing the equipment 16

Changing the language displayed by the cycler 16

Preparing for treatment 19

Completing the prime and alarms test 21

Making the cartridge connections 27

Performing the treatment 28

Ending the treatment 32

Maintaining the cycler 34

Common procedures 37

System settings 42

Installing the equipment

Install your equipment following the instructions in the user guides.

- Check the cycler system settings.
- Make sure that the settings displayed match the default values in Chapter 9 of the user guide and your specific cycler system settings, as required.

When changing settings, always follow these steps:

1. After updating the Parameter Number 0 (Cartridge Type) setting, tap the arrow buttons in the top window to scroll through all system settings to confirm that they are correct.
2. Turn the cycler **off** and then **on** again to save the settings.

Note: Failing to follow the above steps may cause a set-up error when the cycler is turned on.

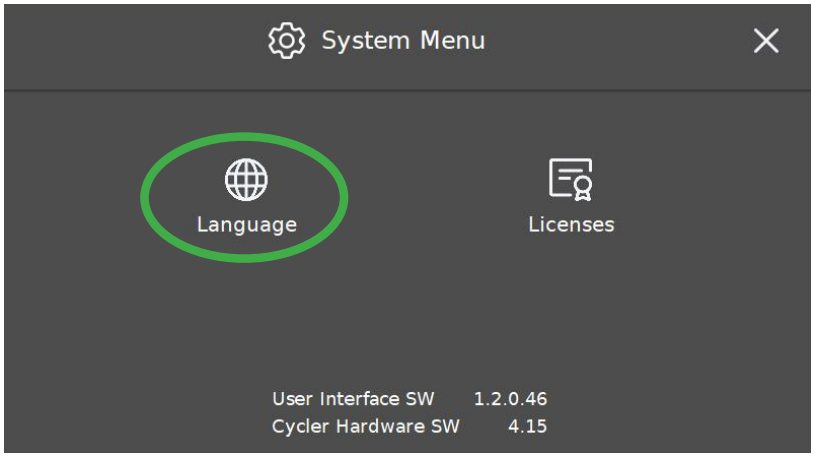
Changing the language displayed by the cycler

The language displayed by the cycler can be changed before performing treatment. Once a treatment has begun, language selection is no longer available to the user:

To change the language displayed by the cycler:

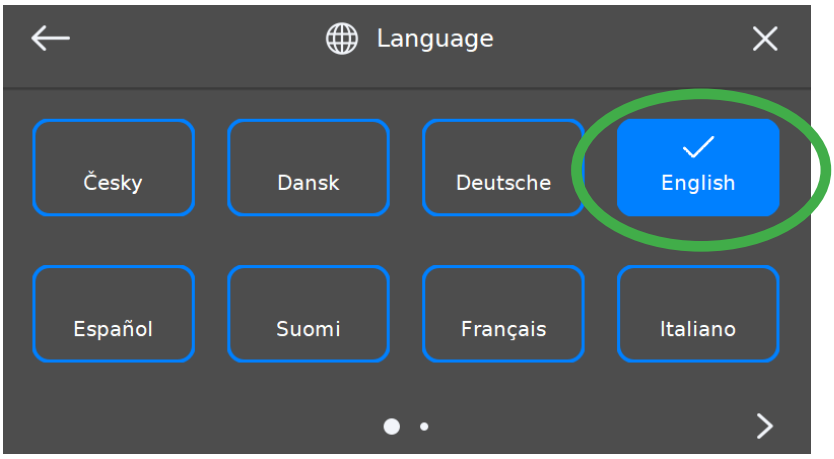
1. Before performing treatment, tap **SYSTEM MENU**

2. When the menu opens, tap **LANGUAGE**.



3. Press the language key to change the cycler's screen text to that language.

Note: The language currently displayed appears in blue.

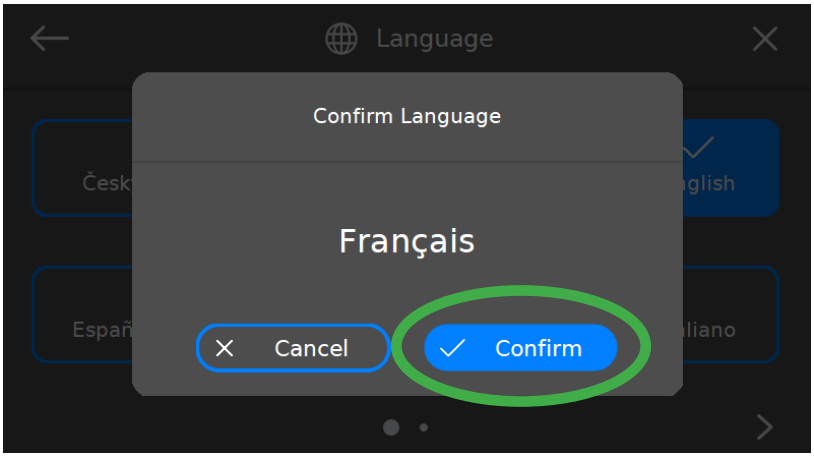


Note: Press the arrow key in the bottom-right corner for more language options.

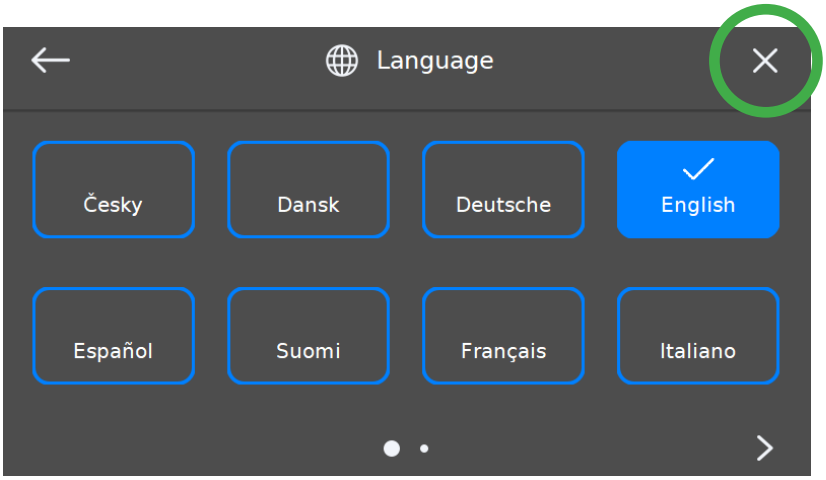
The **Confirm Language** pop-up window appears.

4. Tap **CONFIRM** to confirm the language you selected.

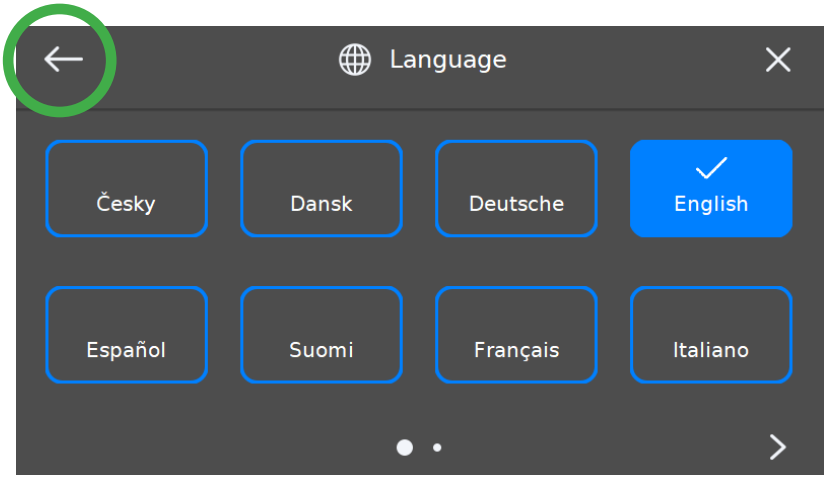
Note: The language only changes after you confirm the new language.



5. Press the close key in the top-right corner of the **Language** menu to go back to the main cycler display.



Note: You can also press the back key to return to the **System Menu**.



Preparing for treatment

Setting up

1. Wash your hands.
2. Gather the supplies and inspect for damage.
3. Make sure that the dialysate matches your prescription.
4. Open the cycler door.
   - › Lift up the front handle until it clicks.
   - › Pull the handle toward you to open the door.
5. Turn the cycler power switch **ON**.
   - › The yellow caution window flashes.
6. Remove the 1-L bag of normal saline from the package.
7. Hang the saline bag on the IV pole.



Hang the saline bag

Loading the cartridge

Remember to secure connections and caps and to remove the paper tape and the line organizer before inserting the cartridge.

1. Remove the cartridge from its package carefully.
2. Tighten all of the connections and caps on the lines.
3. Remove the paper tape, line organizer, and connector tabs, if present.
4. Insert the cartridge into the cycler.
5. Press air detector tubing segments into the cycler.
6. Close the door of the cycler.
7. Push down the door handle until it clicks to lock it.



Insert the cartridge into the cycler

If using the Express Fluid Warmer:

1. Place the 5-liter bag directly on top of the heater plate. Ensure that the bag is fully covering the dialysate bag sensor.
2. Align the left side of the bag with the left side of the fluid warmer.
3. Make sure to snap the cover onto the snaps on the back of the fluid warmer.
4. Bring the cover over the bag.
5. Attach the snap-on buttons to the front of the fluid warmer.
6. Plug the power interconnect cord into the cycler.

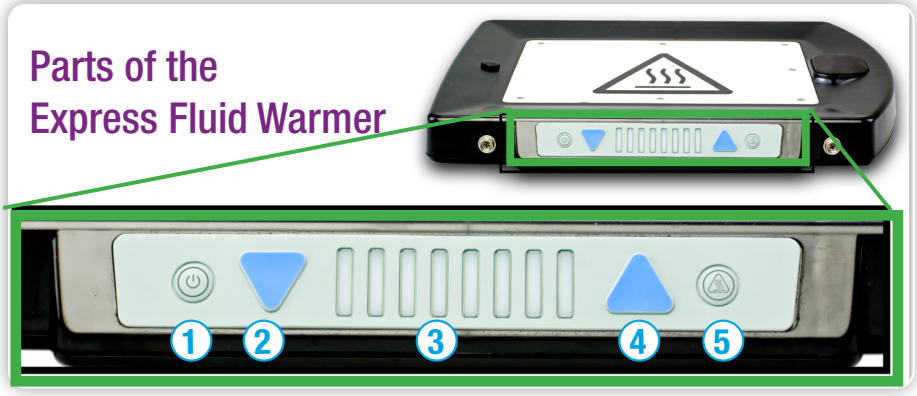
Note: If you need to turn off the fluid warmer, unplug the AC power cord from the back of the cycler of fluid warmer.

Note: The power interconnect cord used with VersiHD has a two-prong plug connection to the cycler.

7. Check that the self-test completes successfully.
   - The status lights flash red, yellow, and then green.
   - The **STANDBY** and **HOT SURFACE** indicator lights turn on and off.
8. Press the **UP** arrow key four times until you see four light bars of the comfort setting lights light up on the fluid warmer. If fewer than four bars are lit, this may cause a low temperature alarm on the cycler.

Note: If the fluid warmer is in Standby Mode and plugged in,there is no self-test. The dialysate starts warming when you press the **UP** arrow key.

Parts of the Express Fluid Warmer



1	Standby indicator light
2	Down arrow
3	Comfort setting light bars
4	Up arrow
5	Hot surface indicator

Warning: Do not use any fluid bags that are leaking, and use caution not to spill fluids near the warmer. If the warmer is plugged in, leaking or spilled fluids in the warmer power receptacle can cause an electrical short even if the warmer is not being used. This can lead to an electrical fire and risk of serious injury or death.

Completing the prime and alarms test

Priming the cartridge

Before treatment, the cartridge lines and dialyzer must be flushed with saline to eliminate all air.

1. Wash your hands.
2. Put on gloves.
3. Insert the cartridge priming spike into a 1L bag of saline, using a twisting motion.
   - › The tip of the priming spike should be visible in the saline bag.
4. Attach the access pressure pod.
   a. Hold the pressure pod monitoring line behind the locking collar.
   b. Insert the tip of the line into the connector on the right side of the cycler.
   c. Twist the tip a quarter (¼) turn to the left to seal the connection.
   d. Tighten the locking collar.
5. Tap **ADD FLUID**  on the cycler.
6. Secure the waste line extension with the yellow clamp to the IV pole.
7. Put the end of the waste line extension in the drain.



The tip of the priming spike in the saline bag.



Access pressure pod monitoring line attached

IMPORTANT: Do not make cartridge or patient connections until ALL of the following occurs:

- ✓ Prime and alarms tests are complete.
- ✓ The air has been removed from the cartridge and dialyzer (snap and tap).
- ✓ The Rate screen displays on the cycler.

Verifying the prime and alarms test

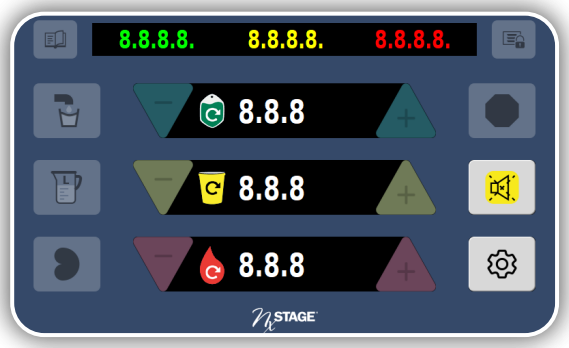
When priming is complete, do the following:

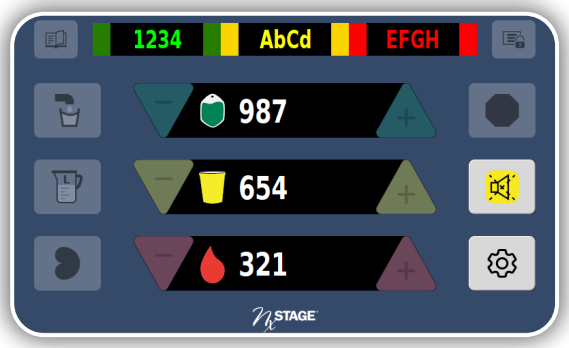
1. Look at the control panel and verify the following:
   - › The number **8** appears in the status bar windows.
   - › The number **8** appears in all three rate/volume windows.
   - › An alarm sounds.
2. Tap **MUTE** .
3. Check that the display test appears on the screen and that you hear an alarm.

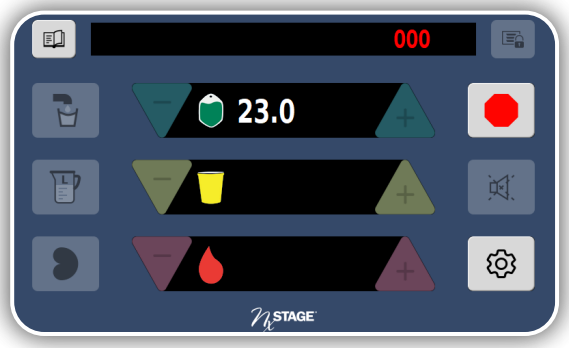
- The following numbers and letters appear:
  - › In the status bar windows:
  - › **1234, AbCd, EFGH.**
- In the three rate/volume windows:
  - › **987, 654, 321.**

4. Tap **MUTE** .

- The following numbers appear:
  - › In the alarm status bar window: **000**
  - › In the dialysate rate/volume window: **23.0**







Note: If you don't see the numbers displayed as shown, call NxStage Technical Support.

5. Verify that the cycler is now in recirculation mode.

During recirculation, the blood and fluid pumps are running. The pumps circulate fluid through the cartridge and saline bag.

- › Do not press STOP .
- › Do not close the clamps.
- › Do not disconnect the lines.

IMPORTANT: Do not make cartridge or patient connections until ALL of the following occurs:

- ✓ Prime and alarms tests are complete.
- ✓ The air has been removed from the cartridge and dialyzer (snap and tap).
- ✓ The Rate screen displays on the cycler.

Removing the air from the cartridge

Observe the blood circuit for air. If you see any air, remove the air starting with the arterial blood line (red clamp) and ending with the venous blood line (blue clamp).

1. Starting at the red clamp on the priming spike, snap and tap the arterial blood line (red clamp).
2. Remove the dialyzer from the cartridge tray.
3. Flip the dialyzer over so that the blue side faces up.
4. Tap the dialyzer against your palm or a soft surface.
5. Put the dialyzer in the filter holder so that the post-dialyzer port faces up.

Note: Make sure there are no kinks in the blood line when placing the dialyzer in the filter holder.



Remove air from the cartridge lines

6. Prime the post-dialyzer port.
   - › Loosen the cap on the post-dialyzer port line to allow the air to escape.
   - › Tighten the cap on the post-dialyzer port line.
7. Close the blue clamp on the post-dialyzer port securely.
8. Move to the venous blood line (blue clamp) where it exits from the dialyzer and goes into the cycler.
9. Snap and tap the venous blood line from where it exits the top of the cycler door and move towards the priming spike.
   - › Follow the venous blood line from where it leaves the dialyzer to the blue clamp on the priming spike.
10. Tap **STOP** .
11. Prime the saline “T” (short line with a white clamp) on the arterial blood line.
    - › Loosen the cap on the saline “T” to allow the air to escape.
    - › Tighten the cap on the saline “T.”
12. Close the white clamp on the saline “T” securely.

If using CAR-172:

Prime the heparin line with the white clamp.

1. Loosen the cap on the heparin line until saline flows out.
2. Tighten the cap on the heparin line.
3. Close the white clamp on the heparin line securely.

Preparing the dialysate source

If using the PureFlow SL:

Note: Always check chloramines before using a new batch.

1. Press **GO** on the PureFlow SL.
   - › The control panel shows the message "Config to Use Batch."
2. Press **GO** again.
   - › The control panel shows the message "Batch in Use."
3. Close the green clamp below the 1.2 micron filter on the SAK dialysate outlet line.
   - › Do NOT close the green non-reopening clamp on the dialysate outlet line.

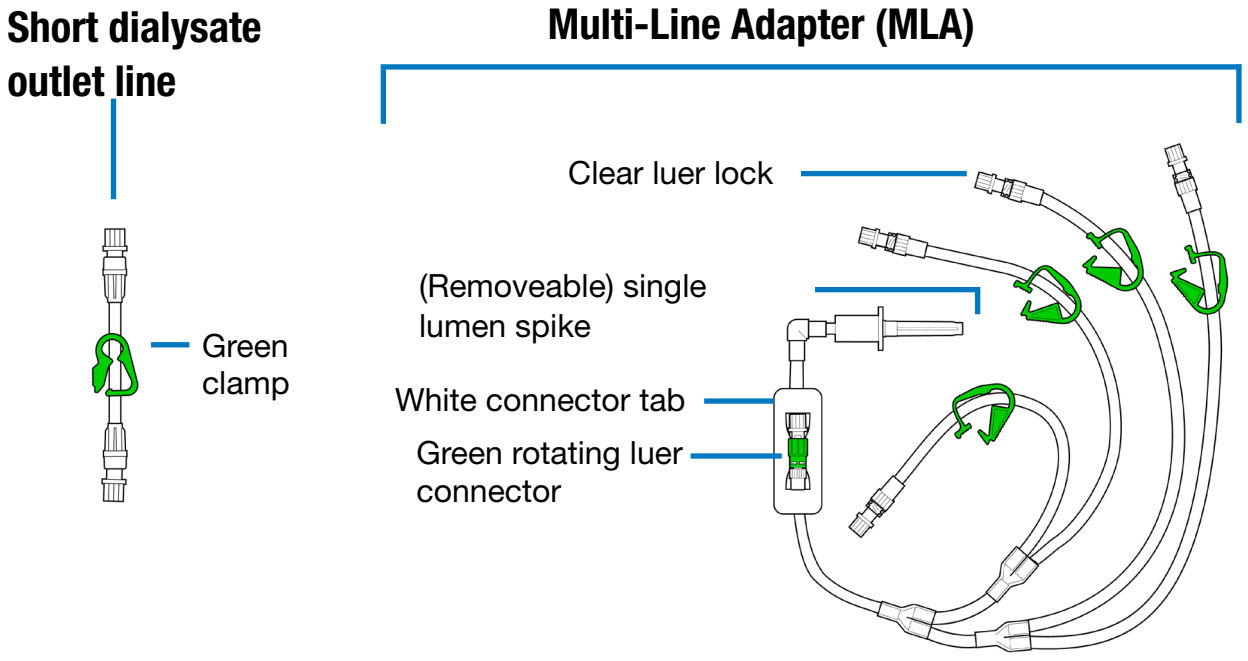
For complete details of connecting the PureFlow SL to the cartridge, see "Connecting to the Cartridge" on page 57.

If using the Express Fluid Warmer:

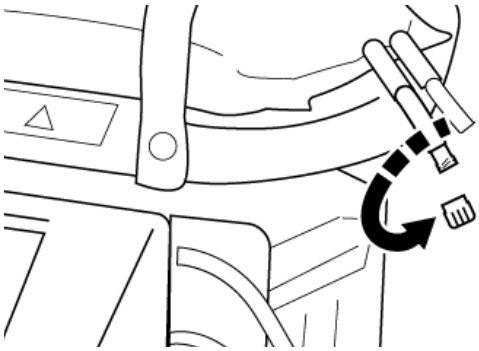
1. Hang the dialysate bags on the IV pole.

Note: The Express Fluid Warmer IV pole safely holds 21 L of fluid, using 2 hooks per dialysate bag.

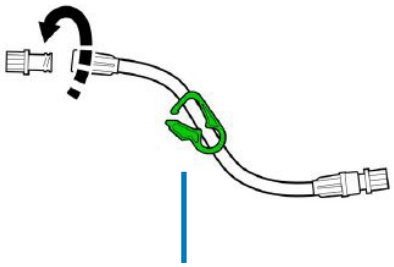
2. Make sure that all caps on the Multi-Line Adapter (MLA) are finger-tight and all green clamps are open.



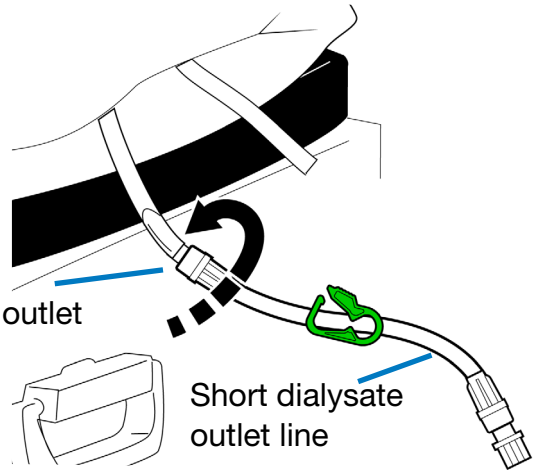
3. On the fluid warmer dialysate bag, remove the cap from the dialysate outlet port closest to the cartridge.



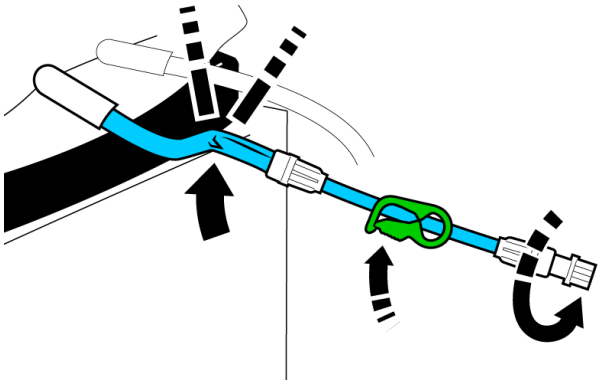
4. Remove the cap from one end of the short dialysate outlet line and connect it to the fluid warmer dialysate bag.



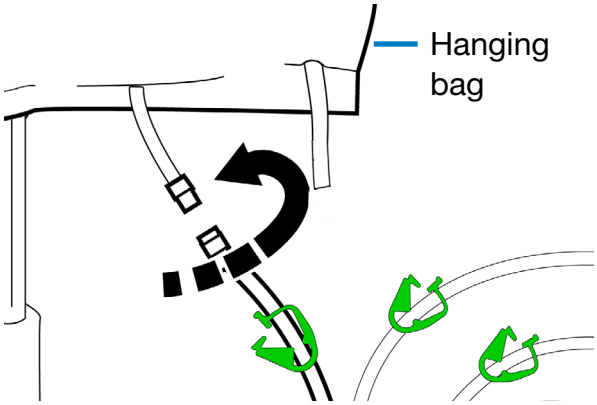
Short dialysate outlet line



5. Break the frangible in the dialysate bag's outlet port.
   a. Prime the short dialysate outlet line and finger-tighten the cap.
   b. Close the green clamp on the short dialysate outlet line.



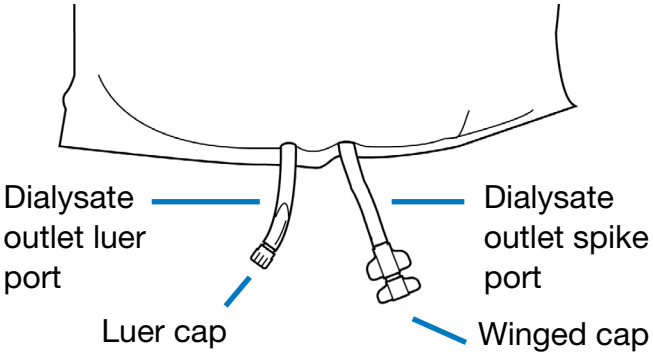
6. For each of the hanging dialysate bags:
   a. Remove the cap from the port.
   b. Connect one line from the MLA with a clear luer connection to the bag.
   c. Finger-tighten the connections.



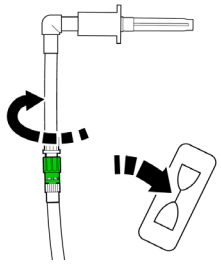
If using the Express Fluid Warmer:

7. Identify which type of dialysate bags are used. The MLA has a removeable spike to accommodate either bag configuration.

Option A: Spike and luer port

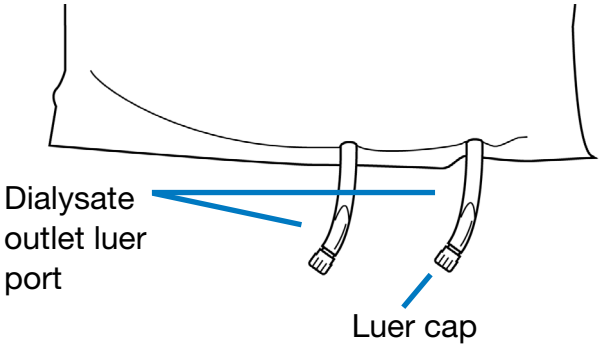


8. On the fluid warmer dialysate bag, twist off the winged cap from the dialysate outlet spike port.
9. If your MLA has a white connector tab, remove it, then tighten the spike and green luer connection on the MLA by twisting clockwise.

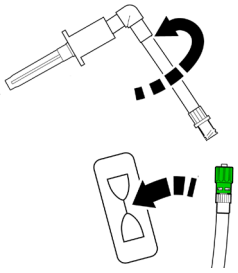


10. Remove the cap from the MLA spike and insert the spike into the bag on the fluid warmer.
11. Make sure there are no kinks in the lines.
12. Break the frangibles on the hanging bags.

Option B: Two luer ports



8. On the fluid warmer dialysate bag, remove the luer cap from the remaining port.
9. Remove the white connector tab, then remove the spike assembly from the MLA line by twisting counterclockwise and discard.



10. Connect the green rotating luer connector of the MLA line to the port of the dialysate bag that is resting on the fluid warmer.
11. Make sure there are no kinks in the lines.
12. Break the frangibles on the fluid warmer bag and hanging bags.

13. Prime and close the clamps on any unused MLA lines.
14. For complete details of connecting the dialysate bag to the cartridge, see “Making the cartridge connections” on page 27.

Refer to the Express Fluid Warmer User Guide for additional information.

Making the cartridge connections

After the Prime and Alarms test and the display tests, make non-patient connections to the cartridge.

IMPORTANT: Do not connect the patient lines at this time.

Making the fluid line connections

Remember to use aseptic technique when making cartridge connections.

1. Locate the saline line (white clamp) at the priming spike.

Note: The saline line is connected to the dialysate fluid inlet line.

2. Close the white clamps on the saline line.
3. Close the green clamp on the dialysate fluid inlet line.
4. Disconnect the saline line from the priming spike.
5. Remove the cap from the saline "T."
6. Connect the saline line (white clamp) to the saline "T" (white clamp) on the arterial blood line.

Note: Do not open the white clamps.

7. Connect the cartridge dialysate fluid inlet line (green clamp) to one of the following dialysate sources:
   - **If using PureFlow SL** - Connect it to the SAK dialysate outlet line (green clamp).
   - **If using Express Fluid Warmer** - Connect it to the short dialysate outlet line (green clamp) of the bag on the warmer.
8. Open the green clamps on both lines.

Making the waste line connections

If using the PureFlow™ SL:	If using the Express Fluid Warmer:
1. Locate the waste line (yellow clamp) at the priming spike. 2. Close the yellow clamps on the waste line. 3. Disconnect the cartridge waste line from the priming spike. 4. Connect the cartridge waste line to the waste line adapter on the PureFlow SL control unit. 5. Open the yellow clamps on the cartridge waste line and the waste line adapter.	1. Locate the waste line (yellow clamp) at the priming spike. 2. Close the yellow clamps on the waste line. 3. Disconnect the waste line from the priming spike. 4. Connect the waste line (yellow clamp) to the waste line extension (yellow clamp). 5. Place the end of the waste line extension into an appropriate plumbing drain, such as a tub or sink. 6. Open the yellow clamps on both lines.

Testing the fluid detection sensor

1. Moisten a clean cloth with tap water.
2. Touch the sensor's stainless steel bars. If the sensor is working properly, the alarm sounds.
3. Dry the sensor.
4. Position the sensor in the cycler base.

Performing the treatment

Entering the treatment settings

> **"Enter settings to do, then move red and blue."**

Before treatment, enter the treatment parameters on the cycler, using the Rate and Volume screens. Refer to "Entering the treatment parameters" on page 13.

Volume screen:	Confirm dialysate volume Set ultrafiltration volume
Rate screen:	Confirm or set dialysate rate Set ultrafiltration rate Confirm blood flow rate

Remember:

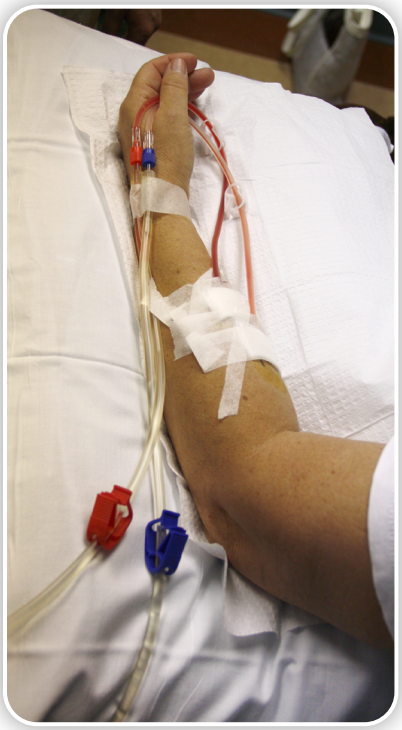
- The starting blood flow rate is typically 200 mL/min, which is then increased to the prescribed treatment rate.
- If using bagged dialysate, the maximum dialysate rate is 12 L/hr.
- Always determine the ultrafiltration volume target correctly by subtracting an accurate dry weight from an accurate pre-dialysis weight.
- To avoid cardiac stunning, the ultrafiltration rate should not exceed 10 mL/kg/hr.
- Make sure that the dialysate volume displayed matches the prescription.
- Tapping **TREATMENT** on the cycler starts dialysate delivery on the PureFlow SL.

Making the patient connections

After priming the cartridge and entering your treatment settings, make the patient connections.

Note: Remember to use aseptic technique. Remove gloves and put on a new clean pair before performing tasks with the vascular access and blood lines.

1. Follow aseptic technique to establish the vascular access.
2. Take blood samples, if ordered.
3. Give anticoagulant as prescribed.
4. Starting at the priming spike, close the red clamps on the arterial blood line and the blue clamps on the venous blood line.
5. Disconnect the arterial blood line (red clamp) from the priming spike.
6. Connect the arterial blood line (red clamp) to the arterial vascular access line.
7. Connect a sterile 10 mL luer-lock syringe to the red port on the priming spike.
8. Disconnect the venous blood line (blue clamp) from the priming spike.
9. Connect the venous blood line (blue clamp) to the venous vascular access line.
10. Connect a sterile 10 mL luer-lock syringe to the blue port on the priming spike.
11. Open all four red and blue clamps on the arterial and the venous blood lines and the vascular access lines.
12. Fill each 10 mL syringe attached to the priming spike with 10 mL of saline.
13. Close the red and blue priming spike clamps.



The patient lines attached.

Note: Follow the center's instructions. You may be instructed to use pre-filled syringes or an alternative type of cap to attach to the priming spike.

Before starting the treatment, check the following:

- The dialyzer is in the filter holder with the post-dialyzer port upright.
- None of the fluid lines are kinked.
- The blue clamp on the post-dialyzer port is closed.
- The cartridge waste line (yellow clamps) is connected to the waste line extension or to the PureFlow SL waste line adapter and all clamps are open.
- The arterial and venous blood lines (red and blue clamps) are visible, have no kinks, are connected securely to the vascular access lines, and all clamps are open.
- All connections and caps are tight.
- The white clamps on the saline line and saline "T" are closed.
- The dialysate source is connected to dialysate inlet line (green clamp) and all clamps are open.



The cycler set up for treatment

If using CAR-172:

If the heparin infusion line is not being used:

› Close the clamp on the heparin line.

› Close the cap tightly.

Starting the treatment

1. Tap **TREATMENT** on the cycler.
2. Increase the blood flow rate to the prescribed rate.
3. Monitor the arterial and venous access pressures.

   If the arterial access flow is poor, the blood flow rate may be too high. This can cause small air bubbles in the arterial blood line (red clamp), resulting in an Alarm #11: Check for arterial air during TREATMENT.

Note: The cycler shows the arterial access pressures without a negative sign.

Monitoring the treatment

Once treatment has started, you see Caution #7, and then Caution #8.
During treatment, Caution #2 occurs regularly.

Do the following during treatment:

1. Resolve all alarms and cautions.
   The blood lines and dialyzer can begin clotting when the cycler blood pump is off.
   Repeatedly tapping **MUTE**  **- STOP**  **-TREATMENT**  on the cycler during an alarm does not address the cause of the alarm and increases the potential for clotting.
2. Check for air in the venous header of the dialyzer.
   a. If there is air, remove the air from the post-dialyzer port line with a 20 mL luer-lock syringe.
   b. Flush the line with 3 mL of saline to clear the blood and then close the blue clamp.
3. Make sure that the needles and the blood lines are taped securely and visible at all times.
4. Verify that the arterial and venous access pressures are within the expected ranges.
   - A normal arterial pressure is between -50 and -200 mmHg.
   - A normal venous pressure is between 20 and 300 mmHg.
5. Check that the white clamps on the saline line and saline “T” are closed.
6. Observe the blood circuit for signs of clotting.
7. Inspect the system periodically for evidence of leaks.

If using the Express Fluid Warmer:

1. Check that the dialysate bag on the warmer is full of dialysate.
2. Confirm that the dialysate bags have enough fluid and are draining evenly.

Ending the treatment

The treatment ends when the volume targets are met. At the end of treatment, the following occurs:

- The yellow caution status window shows **000**.
- The dialysate and ultrafiltration rate windows show **0**.
- The blood pump continues to run.

If you need to draw a blood sample at the end of treatment, see “Taking a blood sample” on page 41.

Performing an automated rinseback

1. Check the saline bag to make sure it has 300–500 mL left when volume targets (ultrafiltration volume and total dialysate delivered) are met.
2. Tap **STOP** .
   The rinseback volume is displayed.
3. Wash your hands and put on clean gloves.
4. Close the red clamps on the arterial blood line and the arterial vascular access line.
5. Disconnect the arterial blood line (red clamp) from the arterial vascular access line.
6. Connect the arterial blood line (red clamp) to the priming spike line with the red clamp.
7. Open the red clamps on the arterial blood line and on the priming spike.
8. Tap **ADD FLUID** on the cycler.
   The rinseback volume number counts down to zero (**0**).
9. When rinseback is complete, close the blue clamps on the venous blood line and the venous vascular access line.
10. Disconnect the venous blood line (blue clamp) from the venous vascular access line.
11. Connect the venous blood line (blue clamp) to the priming spike line with the blue clamp.
12. Remove the fistula needles and care for the access site.

Reviewing the treatment summary

1. Tap the **VOLUME TOGGLE** icon to see the treatment summary information.
2. Record the following information:

- Total treatment time.
- Total dialysate delivered.
- Total ultrafiltration removed.
- Total blood processed, in liters.

Important! Make sure you write down the treatment summary values before turning off the cycler. When you turn off the cycler, the treatment summary disappears and cannot be retrieved.

Turning the system off

1. Turn the cycler power switch **OFF**.
2. Remove and appropriately throw away disposables.

If using the Express Fluid Warmer:

Check the warmer to see if the **STANDBY** ⏻ indicator lights are lit. If not, do the following:

1. Press the **DOWN** ▼ arrow until all of the comfort setting lights turn off and the **STANDBY** ⏻ indicator lights are lit.
2. Make sure the hot surface light is off.
3. Remove the warmer disposables.
4. Disconnect the interconnect power cord.

Disposal guidelines:

Maintaining the cycler

Cleaning and disinfecting equipment after every treatment

Clean and disinfect all exterior surfaces of your dialysis equipment after each treatment.

1. Close the cycler door.
2. Use a paper towel and mild detergent such as a dishwashing liquid to clean all exterior surfaces.

Note: Do not allow fluid to drip inside the equipment.

3. If you see blood on any surfaces, disinfect the cycler using a bleach solution prepared according to the table below. Allow the solution to remain in contact with the surface for 10 minutes.

Sodium Hypochlorite Concentration	Water-To-Bleach Solution
5.0% - 5.9%	Add 16 oz water and 2 oz household bleach
6.0% - 6.9%	Add 20 oz water and 2 oz household bleach
7.0% - 7.9%	Add 24 oz water and 2 oz household bleach
8.0% - 8.9%	Add 28 oz water and 2 oz household bleach

Note: Most common household bleaches have a concentration of 5.25%-6.15% sodium hypochlorite. Refer to the product label for the actual strength of the product.

4. Throw away used cleaning supplies.

Cleaning the air detectors

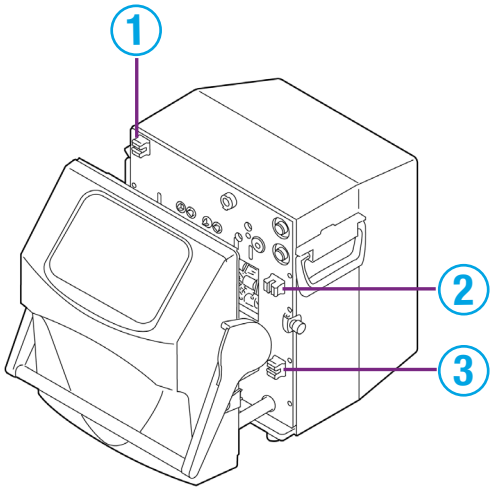
Clean the detector at least once a month or more frequently if needed.

- Remove all jewelry before putting your hand inside the cycler.
- Camera or eyeglasses lens cloths can be used for cleaning the detectors.
- Do not touch other sensors or detectors during this procedure.

1. Unplug the cycler before cleaning the air detectors.
2. Open the door of the cycler.

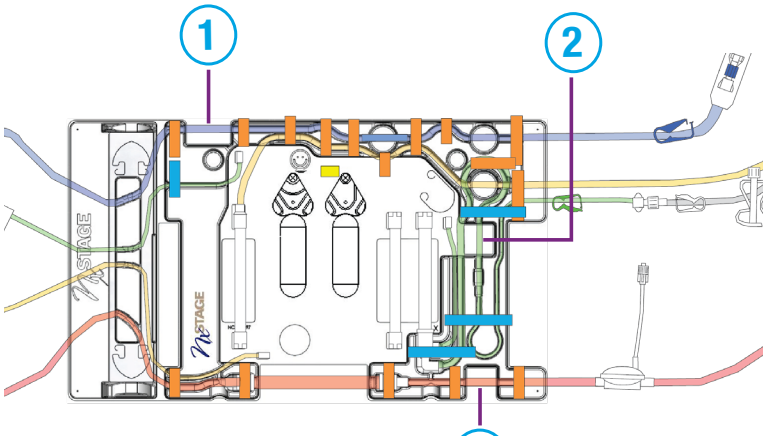
The air detectors are inside the cycler located in the top left (venous blood line), middle right (dialysate line), and bottom right (arterial blood line).

1. Venous blood line air detector
2. Dialysate line air detector
3. Arterial blood line air detector

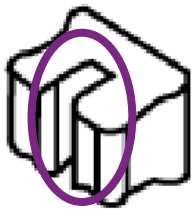


Representative cartridge provided to show the air detector locations

1. Venous blood line (top left)
2. Dialysate line (middle right)
3. Arterial blood line (middle right)

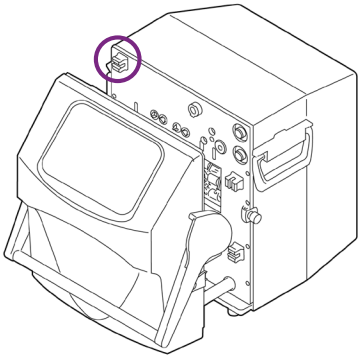


3. Clean both surfaces of the air detector with a soft, extra-low-lint cloth dampened with tap water.
   - › Make sure that the cloth is not dripping wet.
   - › Wipe the cloth in one direction to clear out any foreign material.
   - › Clean the tube routing for the sensor as shown.

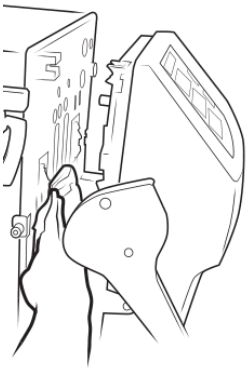


Air detector tube routing

4. Start with the venous blood line air detector.



5. Dry the air detector with a clean, soft, extra-low-lint cloth.



6. Repeat for the dialysate line air detector and then the arterial blood line detector.

Cleaning the blood leak detector

Clean the detector at least once a month or more frequently if needed.

- Remove all jewelry before putting your hand inside the cycler.
- Camera or eyeglasses lens cloths can be used for cleaning the detector and mirror.
- Do not touch other sensors during this procedure.

1. Unplug the cycler.
2. Open the door of the cycler.
3. The blood leak detector is inside the cycler, on the left.
4. Look for the mirror directly across from the blood leak detector.
5. Moisten a clean, soft, lint-free cloth with tap water.
6. Wipe the blood leak detector and mirror to remove dust and debris.
7. Dry the blood leak detector and mirror with a new dry lint-free cloth.
8. Throw away used cleaning supplies.

Common procedures

Note: Please refer to the Keep Calm and Carry On Quick Reference Guide for instructions on troubleshooting common alarms and cautions and managing medical complications.

Resetting the access pressure pod

1. Tap **MUTE** to silence the alarm.
2. Identify and fix the probable cause(s).

Check for	Do
Access pressure pod connection error: the monitoring line is leaking, poorly connected, or not connected.	Follow the procedure below to reset the access pressure pod.
The access pressure pod monitoring line has a kink in it.	Remove the kink in the access pressure pod monitoring line.

Reset the access pressure pod as follows:

1. Disconnect the access monitoring line from the cycler.
   - › The access pressure pod deflates.
2. Tap **STOP** .

If the pod fills immediately:	If the pod does not fill immediately:
a. Attach the access pressure pod monitoring line to the connection point on the cycler. b. Tap **TREATMENT** to resume the treatment. c. Confirm that arterial pressures are within range.	a. Close the red clamp on the arterial blood line. b. Open the white clamps on the saline line and saline “T.” c. The pod fills with blood. d. Close the white clamps on the saline line and saline “T.” e. Open the red clamp on the arterial blood line. f. Attach the access pressure pod monitoring line to the connection point on the cycler. g. Tap **TREATMENT** to resume the treatment. h. Confirm that arterial pressures are within range.

Performing an emergency rinseback

Use emergency rinseback when you need to return blood quickly. Do not return blood if blood circuit is clotted or hemolyzed, air is seen in the blood circuit or in the patient blood lines, or if blood flow stops for an extended time.

1. Make sure there is enough saline to rinse back the blood.

Note: There must be 300-500 mL of saline available to rinse back blood.

2. Open the white clamps on the saline line and saline "T."
3. Check the flow of saline.
4. Close the red clamp on the arterial blood line.
5. Let the saline infuse the blood lines to return the blood.
6. Tap **STOP** on the cycler when the venous blood line (blue clamp) is clear.
7. Close the clamps on the vascular access lines.
8. Close the red clamp on the arterial blood line.
9. Disconnect the arterial blood line from the vascular access.
10. Connect the arterial blood line to the red port on the priming spike.
11. Close the blue clamp on the venous blood line.
12. Disconnect the venous blood line from the vascular access.
13. Connect the venous blood line to the blue port on the priming spike.
14. Turn the cycler power switch **OFF**.
15. Remove and appropriately throw away disposables.

If using the Express Fluid Warmer:

Check the warmer to see if the **STANDBY** indicator lights are lit. If not, do the following:

1. Press the **DOWN** arrow until all of the comfort setting lights turn off and the **STANDBY** indicator lights are lit.
2. Make sure the hot surface light is off.
3. Remove the warmer disposables.
4. Disconnect the interconnect power cord.

Ending treatment without returning your blood

There are times when rinseback cannot be performed, for example during a power failure, a recurring alarm, if the blood circuit is clotted or hemolyzed, air is seen in the patient blood lines, or another problem that cannot be resolved.

1. Turn off the cycler.
2. Care for your vascular access.
3. Discard the cartridge.
4. Call your center immediately to report the problem you experienced and the blood loss.

Delivering a manual fluid bolus

1. Make sure there is enough saline available (between 300- 500 mL) for the bolus.
2. Make sure the saline line is primed.
3. Open the white clamps on the saline line and saline “T.”
4. Give the desired fluid volume.
5. Close the white clamps on the saline line and saline “T”.
6. Write down the amount of saline given and add the volume delivered to your ultrafiltration volume.

Note: This procedure can be used to check the dialyzer for clotting, if required. The dialyzer is best seen if the red clamp on the arterial blood line is closed while saline is given. Open the red clamps on the arterial blood line after the bolus.

Reducing the UFR quickly

1. Press and hold **STOP** on the cycler.
   - The dialysate and UF rate windows show three zeros (**000**).
   - The yellow caution window shows three zeros (**000**).
   - The pump on indicator lights turn off.
   - The blood pump continues to run.
2. Treat any symptoms following your dialysis center’s procedure.

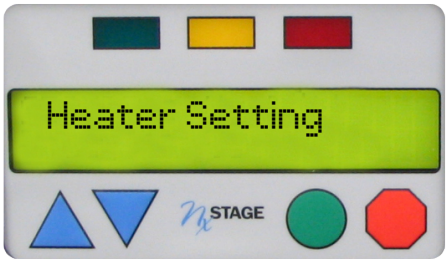
For example: Give a saline bolus or decrease the UF rate and/or volume.

3. Tap **TREATMENT** to resume the treatment.

Ending the treatment early

1. Press and hold **STOP** on the cycler.
2. Press **STOP** again.
   - Begin the normal “Ending the treatment” on page 32
   - Continue to “Performing an automated rinseback” on page 32.

Adjusting the dialysate temperature

If using the PureFlow SL:	If using the Express Fluid Warmer:
1. Press the **UP** ▲ or **DOWN** ▼ arrow on the control panel to go to the heater setting. The display shows the current setting. 2. Press the **UP** ▲ or **DOWN** ▼ arrows to adjust the heater setting from 0 to 20. 3. Press **GO** ● or wait three seconds to return to the previous display.  **Note**: The heater does not turn on until there is enough fluid in the SAK. If you select "**0**" the heater is off.	▪ Press the **UP** ▲ arrow for warmer or the **DOWN** ▼ arrow for cooler. ▪ One comfort setting light bar turns on or off with each time that you press the arrow.

Taking a blood sample

To draw a pre-treatment blood sample:	To draw a post treatment blood sample:
1. Put on clean gloves. 2. Draw a sample of blood directly from the arterial vascular access line.	1. Watch the cycler display until you see **000** in the yellow caution window at the end of treatment and before RINSEBACK mode. › The dialysate and UF rate windows show three zeros (**000**). › The blood pump continues to run. 2. Allow the blood to circulate for three (3) minutes. › Do not reduce the blood flow rate now. 3. Prepare blood collection tubes for the sample. 4. Tap **STOP** on the cycler. 5. Put on clean gloves. 6. Close the red clamps on the arterial blood line and the arterial vascular access line. 7. Disconnect the arterial blood line and connect it to the red port on the priming spike. 8. Open the red clamps on arterial blood line and the priming spike line. 9. Attach the blood collection tube to the arterial vascular access line. 10. Open the clamp on the arterial vascular access line. 11. Withdraw _____ mL (typically 2 – 3 mL) of blood. 12. Close the clamp on the arterial vascular access line. 13. Follow your center's protocols for labeling, spinning, storing and transportation of samples. 14. Remove and dispose of gloves and supplies. 15. Tap **ADD FLUID** on the cycler and complete the rest of the treatment. See "Ending the treatment" on page 32.

System settings

System settings are set in your cycler according to your treatment prescription and center instructions. The *Your Suggested Settings* column will be filled out by you or your training nurse.

Note: When you change or check a system setting, remember to do the following:
- Always scroll through **all** system settings to confirm that they are correct.
- Turn the cycler off and then on again to save the settings.
- For further details, see below.

Changing system settings

Complete instructions for setting system settings are located in your cycler's user guide.

1. Turn **ON** the power switch on the back of the cycler.
   - The front panel flashes "**888**" several times, goes blank, and then flashes "**888**" again.
2. When you hear a click, press and hold **TREATMENT** to enter system settings mode.

Note: System settings can also be accessed by quickly pressing **TREATMENT** several times.

3. Watch for the number **0** in the top green window. You are now in system settings mode.
   - The top green window displays the selected system setting number.
   - The middle yellow window displays the current value of that setting.
   - If the cycler does not display **0** in the top window, repeat steps 1 and 2.
4. Tap the top green window **ADJUSTMENT ARROWS UP** or **DOWN** to select the desired system setting.
   - See the next page for a list of the system settings by number.
5. Tap the middle yellow window **ADJUSTMENT ARROWS UP** or **DOWN** to change the value of the setting.
6. Repeat the process for other system settings, as desired.

Note: After updating *Parameter Number 0 - Cartridge Type*, press the top window **ADJUSTMENT ARROW** to scroll through the remaining system settings. Confirm that the settings are correct before turning the cycler power off and on to save the desired settings. Failure to do so may result in an incorrect set-up error upon powering on the cycler.

Check your cartridge's instructions for use for the suggested system settings.

7. When you have finished changing the system settings, turn **OFF** the power switch on the back panel of the cycler to save the settings.

System Settings for the NxStage cycler

System Setting Number	Your Suggested Setting	System Setting Name
0†	0	Cartridge Type
1		Maximum FF (flow fraction)
2		Initial Fluid (dialysate) pump rate (PR)
3		Start up UF rate
4	200	Start up blood flow rate
5	Pt's Prescribed Volume of Dialysate	Prescribed dialysate volume
12	91 mL	Blood volume of the dialyzer
13	1.45	Rinseback factor
22†	40	Dialyzer flush FP
23†	20	Dialyzer flush UFP
24†	250	Dialyzer flush BP
27†	40	Prime FP
31†	600	Recirculation BP
35‡		Dimmed timer
36‡		Dimmed caution intensity
37‡		Dimmed intensity
38‡		Remove rinseback volume (removed prior to UF target removal)
42‡	0	Therapy target met
43‡	30	Volumetric Management System Check Intervalent
47‡	220	Access (Arterial) pressure warning limit (Caution 24)
63‡	15	First Volumetric Management System Check
80	Not to exceed 10 ml/Kg/hr §	Max UF rate (UFR)
81	12 to 18 L/ hr	Max Dialysate rate (FPR)

† Settings for reducing Snap and Tap ‡Optional Settings for Nocturnal Treatment

§Literature suggests that UF rates below 10 ml/hr/kg improve mortality.[1]

1. Flythe JE et al, Rapid fluid removal during dialysis is associated with cardiovascular morbidity and mortality. ***Kidney Int*** 2011; 79(2): 250-257

Notes:



Chapter 4: How do I manage PureFlow™ SL?

Chapter Overview

Introduction 46

Assembling the PureFlow SL 47

Priming a PAK 51

Making a batch of dialysate 54

Discarding a batch 61

Maintenance 63

Collecting water and dialysate samples 65

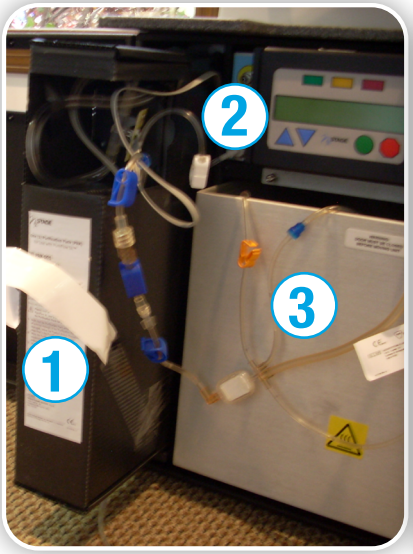
Supplemental procedures 69

Introduction

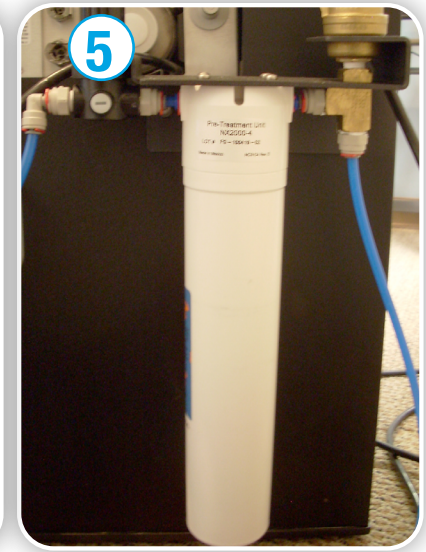
This quick reference guide is designed to assist you with installing and using the PureFlow SL. Refer to the *PureFlow SL User Guide* for additional information.

Parts of the PureFlow SL

1. Purification pack (PAK)
2. Control unit and control panel
3. Tub within cabinet
4. Dialysate sack (SAK)
5. Pretreatment kit, including the following parts:
   - Water line
   - Drain line
   - Sediment filter
   - Water source connectors







Assembling the PureFlow SL

Before using the PureFlow SL, the device must be assembled. When deciding where to place the PureFlow SL Cabinet consider the following:

- Make sure that there is at least 12 inches of space on all sides of the cabinet. Leaving this space around the system allows for easy access and prevents other items from coming into contact with the system.
- The cabinet should be near a cold water source where you will perform the therapy.

If using the standard installation:	If using the LINX water pretreatment system:
The source water line is 40 feet long.	The source water line 60 feet long.

Installing the control unit

1. Slide the control unit into the space above the tub.
2. Pull the tub open.
3. Hand-tighten the two thumb screws under the front of the control unit.

Note: It is easier to tighten thumb screws if you slide out the tub.

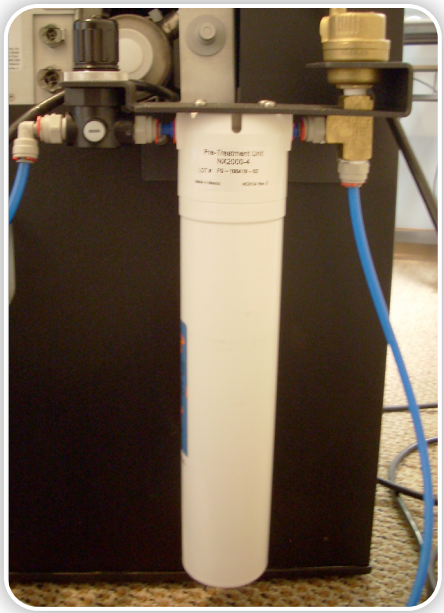
4. Close the tub.



Installing the control unit

Installing the pre-treatment unit

1. Place the bracket over the two screw heads on the back of the cabinet.
2. Make sure that:
   - The nylon washer rests between the cabinet and the pre-treatment bracket.
   - The metal washer rests between the screw head and the pre-treatment bracket.
3. Adjust the screws as necessary.
4. Push down on the bracket to make sure that the pre-treatment unit is seated securely on the screws.
5. Tighten the screws.
6. Pull gently on the bracket to make sure that the assembly is secured to the cabinet.



Installing the pre-treatment unit

7. Adjust the air vent.
   - › Turn the air vent clockwise until it stops.
   - › Turn the air vent counterclockwise a half turn.
8. Pull the yellow tab to remove the cap on the sediment filter.
9. Screw the filter onto the filter head attached to the bracket. Hand tighten.
10. Connect the blue water line from the pre-treatment unit to the blue water inlet on the back of the control unit.
    - › The connector snaps into place.
    - › This step completes the pre-treatment unit installation for NX2000-10.
11. If you are using NX2000-1, connect the UV water line to the water outlet.
    - › Both water connections snap into place.
    - › This step completes the pre-treatment installation for NX2000-1.



Remove the yellow cap on the sediment filter

Installing the drain line

When the PureFlow SL is in use, the drain line:

- › Must be in a drain at all times.
- › Should not be placed lower than floor level.
- › Should not be placed higher than three feet above the ground.

1. Attach the black drain line to the drain line connection on the back of the control unit.
   - › The connection snaps into place.
2. Place the end of the drain line into a drain.
   - › Do not submerge the drain line in the drain.

If using the LINX water pretreatment system:
▪ Install the LINX water pretreatment system. ▪ Refer to the *LINX Water Pre-Treatment System User Guide* and the *Installation and Use* video.

Connecting the water source

Use one of the following adapters:



Faucet adapter



Under sink adapter



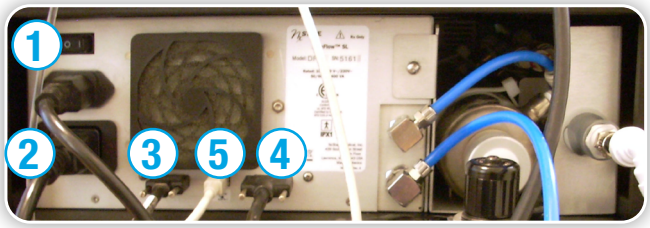
Washer hook-up adapter

If using the standard installation:	If using the LINX water pretreatment system:
1. For instructions on how to connect to your water source, refer to the *PureFlow SL User Guide*. 2. Connect the 40-foot blue PureFlow source water line to the source water supply. 3. Turn on the source water. 4. Check for leaks.	1. For instructions on how to connect to your water source, refer to the *LINX Water Pre-treatment System User Guide*. 2. Connect the green LINX feed water line to the source water supply. 3. Connect the blue LINX treated water line to the Pureflow SL. 4. Turn on the source water. 5. Check for leaks.

Making the electrical connections

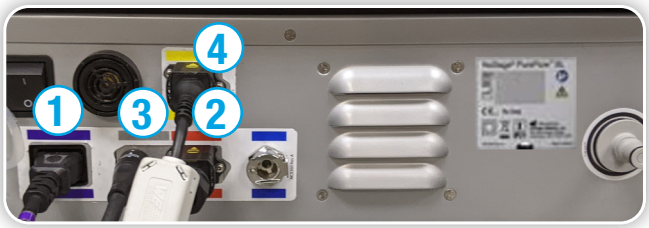
All electrical connections are unique. Each cord fits only one connector on the back of the PureFlow SL control unit.

If using NX2000-1



1. Connect the power interconnect cord from the cycler to the AC power connector.
2. Connect the heater power cord to heater power connector.
3. Connect the cable labeled J2 from the cabinet to the dialysate tub connector.
4. Connect the cable labeled J1 from the UV light tray to the UV light connector.
5. Connect the USB cable to the USB connector and then connect the other end to the cycler's JewelBox or ConNxBox™.

If using NX2000-10

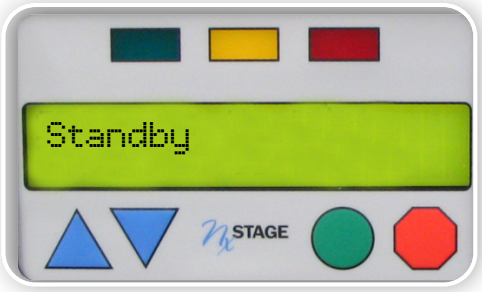


1. Connect the interconnect cord (purple) to the AC power connector. The connector snaps into place.
2. Connect the heater power cord (red) to the heater power connector. The connector snaps into place.
3. Connect the dialysate tub cable (gray) to the dialysate tub connector. Align the connector arrow. The connector snaps into place.
4. Connect the USB cable (yelllow) to the USB connector on the rear panel. The connector snaps into place.

Note: To remove connections 2 and 4, disconnect the cord by gripping and pulling on the connector. Do not pull from the cable. To remove connection 3, grip the connector and rotate it counter-clockwise, and then pull.

Priming a PAK

Installing a new PAK



1. Turn on the PureFlow SL.
2. Check the control panel to make sure that the PureFlow SL is in STANDBY mode.
3. Place the PAK shipping box on its side so that the label faces up.
4. Open the box.
5. Pull the white handle to remove the PAK from the shipping box.
6. Remove the packages of control unit adapters from the side of the new PAK and set them aside.
7. Tear off the perforated section of the PAK.



Perforated section

8. Slide the PAK over the lip and into the PAK compartment in the cabinet.



PAK sliding into compartment

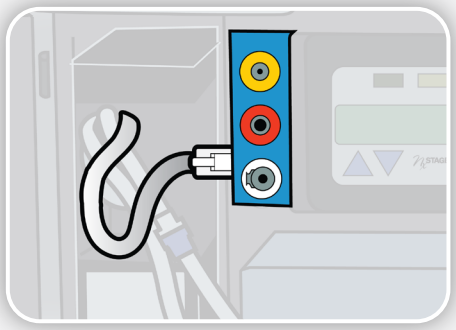
Connecting the water lines and electrical cable to the control unit

The control unit has connectors on the front that are used while making dialysate and during treatment.

The connectors are color-coded by function.

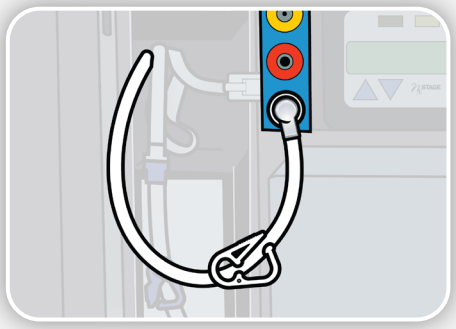
- The waste connector is yellow.
- The conductivity sensor connector is orange.
- The water outlet connector is clear.

1. Remove the tape around the water inlet line with the white clamp and the gray electrical cable.
2. Gently pull the three lines from the PAK.
3. With the tab facing down, insert the electrical cable from the PAK into the electrical connector on the left side of the control unit.

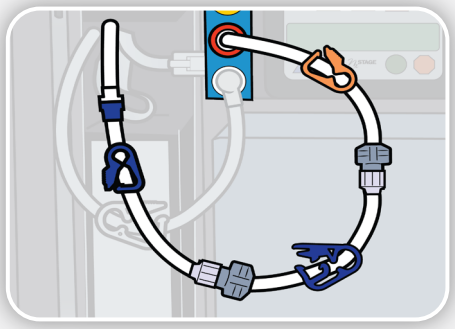


Note: The orientation of the electrical cable when inserted will differ depending on your PFSL model.

4. Connect the PAK water inlet line with the white clamp to the white water outlet connector on the front of the control unit.
5. Push in the connector until you hear or feel a click.



6. Connect the condo adapter line with the orange clamp to the orange conductivity sensor connector on the front of the control unit.
7. Connect the clear connector at the end of the PAK water outlet line with the blue clamp to the condo adapter line with the orange clamp.
8. Connect the waste line adapter with the yellow clamp to the yellow waste line connector on the front of the control unit.

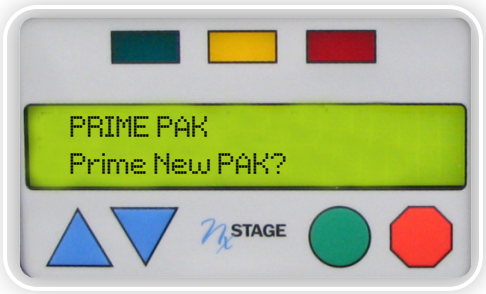


Note: The only time you make this blue to orange connection is when priming a PAK.

Priming a new PAK

You must use a primed PAK to make a batch of dialysate.

1. Make sure that the cold water supply is on.
2. Turn on the PureFlow SL.
3. Check the control panel to make sure that the PureFlow SL is in STANDBY mode.
4. Check that all connections are tight and all clamps are open.
5. Place the drain line in the drain.
6. If using LINX, make sure that the green center light on the LINX system is lit.
7. Press **GO**.
   - The control unit shows the message "`Prime PAK Prime New PAK?`"



8. Press **GO** again.
   - The PureFlow SL starts priming the PAK.
   - Priming takes about 2.5 hours.
   - The control unit shows the message "`Prime PAK Complete. Close Blue Clamps`" when priming is done.



9. Close both blue clamps on the PAK water outlet line and close the orange clamp on the condo adapter line.
10. Press **GO** again to return to STANDBY mode.

Making a batch of dialysate

Loading the SAK

The SAK must be loaded into the tub so that when it is unfolded, the front and rear are at the same height. This ensures that the SAK fills evenly.

1. Make sure that the PureFlow SL is in STANDBY mode.
   - › Press **GO** ●.
2. The control panel shows the message "`Open Door, Load SAK-XXX.`"
3. Remove the SAK from the package.
4. Check for leaks and loose caps or connections.
5. Verify the following :
   - › The SAK type matches your prescription.
   - › The SAK type matches the SAK type shown on the control panel.
   - › The expiration date has not passed.

> **Note**: Refer to "Changing the SAK type" on page 67 for instructions on changing the SAK type.

6. Open the cabinet door and pull out the tub.
7. Place the SAK into the tub with the label facing you.
8. Slide the SAK to the back wall of the tub.
9. Unfold the top fold so the label is against the back wall of the tub.
10. Unfold the front fold toward the front of the tub.
11. Remove and discard the protective foam sheet.
12. Gently push down on the SAK to make sure it is seated correctly.



Tub pulled out

Running the SAK lines

Before connecting the SAK lines, run them through the control panel and the dialysate pump cover.

1. Remove the tape.
2. Uncoil the lines.
3. Check that none of the lines are kinked or crossed.
4. Open the control panel door.
5. Lift up the dialysate pump cover.
6. Insert the five-way connector, elbow joint, and lines into the channels.
7. Run the lines through the channels above and below the connector.
8. Run the dialysate pump line through the dialysate pump.
   - › The dialysate pump line must point to the right.
9. Close the dialysate pump cover.
10. Make sure the lines are properly seated, then close the control panel door.

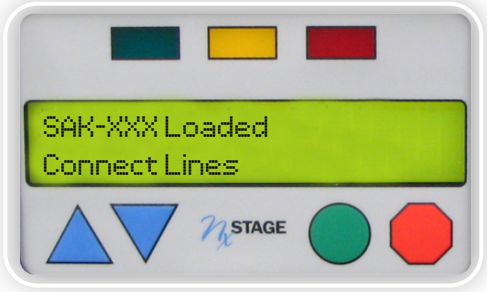


SAK lines in the channels

Note: If using the SAK-40x series, route the pressure relief line around the left side of the closed control unit panel door.

Adjusting the line collar assemblies

1. Locate the lines with the green line collar assemblies exiting from the SAK.
2. Pull the lines on each side of the green line collar assembly to release the fold. Repeat for the second line.
3. Slide the green line collar assemblies over the previously folded areas on both lines.
   - › Wait at least two seconds after closing the control panel door. The display should then tell you to "`Connect Lines`."



Connecting the SAK and PAK lines

1. Close the blue clamp on the PAK water outlet line and the orange clamp on the condo adapter line.
2. Disconnect the PAK water outlet line (blue clamp) from the condo adapter line (orange clamp).

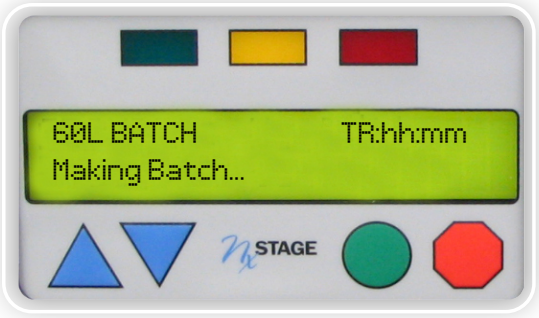
Note: Whenever the condo adapter line is not connected to the PAK during PRIME mode or to the SAK during MAKE BATCH mode, make sure the orange clamp on the line is closed.

3. Disconnect the short line segment with the blue non-reopening clamp from the PAK water outlet line (blue clamp).
4. Remove the protective cap from the SAK water inlet line (blue clamp).
5. Connect the SAK water inlet line (blue clamp) to the PAK water outlet line (blue clamp).
6. Remove the connector tab on the SAK water inlet line (blue clamp).
7. Tighten the blue rotating collar.
8. Open the blue re-opening clamp on the PAK water outlet line.
9. Remove the cap from the SAK conductivity line (orange clamp).
10. Connect the SAK conductivity line (orange clamp) to the condo adapter line (orange clamp) on the front of the control unit.
11. Open the orange clamp on the condo adapter line.
12. Drape the SAK water inlet line into the tub.
13. Completely slide in the tub and close the cabinet door.

Note: Make sure that the lines do not get caught in the cabinet door and are not kinked.

Making a batch of dialysate

Once the SAK has been loaded and properly connected, the PureFlow SL is ready to make a batch.



1. Turn the cold water on.
2. Press **GO** to start the batch.
3. The PFSL conducts a series of tests and then starts making the batch. After these tests are completed, the control panel displays the size of the batch being made and the time remaining until the batch is complete.
   - › A batch takes 5–7 hours depending on the SAK size.

Testing for chloramines/chlorine

To test the batch for chloramines/chlorine, follow the instructions included with the test kit your facility uses. For the best results, test for chloramines within two hours of making a batch. Use test strips that can detect 0.1 parts per million chloramines/chlorine.

1. Turn the cold water on.
2. Check that the automated conductivity check was successful.
3. The control panel shows the message "CHECK CHLORAMINES, Remove Orange Line."
4. Close the orange clamp on the condo adapter line. **DO NOT** close the orange clamp on the SAK line.
5. Disconnect the SAK conductivity line with the orange clamp from the condo adapter line.
6. Hold the line over the specimen container.
7. Press **GO**.
   - › The PureFlow SL dispenses the sample in approximately one minute.
   - › You will hear the valves open before the fluid sample begins dispensing.
   - › After the sample is dispensed, the control panel shows the message "CHECK CHLORAMINES, Reconnect Line."
   - › PureFlow SL software version 1.15 or greater dispenses a 100 mL sample.
   - › PureFlow SL software versions prior to 1.15 dispense a 60 mL fluid sample.



Collect the dialysate sample

8. Reconnect the SAK conductivity line with the orange clamp to the condo adapter line.
9. Open the orange clamp on the condo adapter line.
10. Press **GO**  .
    - › The control panel shows the message
      "CHECK CHLORAMINES
      Pass: GO
      Fail: STOP."

11. Test chloramines using the test kit and instructions provided by your center.

If the sample passes:	If the sample fails:
Press **GO**  on the PureFlow. The control panel shows the time remaining until the batch expires.	a. Press **STOP**  on the PureFlow SL. › The PureFlow SL prompts you to test again. b. Repeat the test procedure. › If the new sample passes, use the batch. However, if the new sample fails, the system automatically goes to DRAIN mode. › To perform a treatment, use dialysate bags or make a new batch.

Using a batch

Remember the following when using a batch:

- The batch must be used before it expires.
- The **Batch Expiration Time** is tracked by the control unit.
- The time tracking begins at the start of mixing the batch of dialysate.
- The drain line must be in a drain at all times.
- Do not submerge the drain line in the drain.
- Use aseptic technique when handling the SAK and making cartridge connections.
- **Always check for chloramines before using a new batch.**

Connecting to the cartridge

Connect the PureFlow SL to the cartridge after the cartridge has been primed.

1. Press **GO** on the PureFlow SL.
   - › The control panel shows the message "XXL BATCH IN USE Config to use Batch."
2. On the cartridge, close the white clamp on the saline line and then close the green clamp on the dialysate inlet line.
3. Disconnect the cartridge saline line and the dialysate inlet line.
4. Close the white clamp on the saline "T" on the arterial blood line.
5. Attach the saline line from the priming spike to the saline "T" (white to white). **Do not open the clamps.**
6. Remove the cap from the outlet of the SAK dialysate outlet line.
7. Connect the SAK dialysate outlet line to the cartridge dialysate inlet line (green to green).

Note: You must use a new dialysate outlet for each treatment.

8. Open the green clamps on both the SAK dialysate outlet line and the cartridge dialysate inlet line.
9. Close the yellow clamp on the cartridge waste line.
10. Disconnect the cartridge waste line from the priming spike and connect it to waste line adapter (yellow clamp) on the PureFlow SL.
11. Open the yellow clamps on the waste line and the waste line adapter.
    - › To start using the batch, press **GO** on the PureFlow SL.

Disconnecting from the cartridge

After the treatment is complete, do the following:

1. Press **STOP** on the PureFlow SL to pause it.
2. Close the non-reopening green clamp on the used SAK dialysate outlet.
3. Close the green clamp on the cartridge dialysate inlet line.
4. Disconnect the cartridge dialysate inlet line from the dialysate outlet line (green clamps).
5. Close the yellow clamps on the cartridge waste line and the waste line adapter (yellow clamps).
6. Disconnect the cartridge waste line from the waste line adapter.
7. Connect the cartridge waste line to the priming spike to prevent leaks.

Keep the PureFlow SL in pause if:	Drain the batch if:
There is enough dialysate remaining for the next treatment.	▪ There is not enough dialysate for the next treatment. ▪ The batch expires before or during the next treatment.

Note: Do not turn off the PureFlow SL between treatments. The batch cools because the heater is off.

Discarding a batch

Once you start draining the SAK, you cannot return to using the batch.

Draining the batch

1. Press and hold **STOP** on the PureFlow .
   - › The control panel shows the message
     `XXL BATCH TR:hh:mm`
     `Cont: GO To Drain: STOP.”`
2. Press **STOP** again.
   - › The control panel shows the message
     “`DRAIN PENDING`
     `Drain: GO Cancel: STOP.”`
3. Press **GO** to start draining the batch.
   - › Once draining is complete, the control panel shows the message
     “`DRAIN COMPLETE`
     `More: GO Done: STOP.”`
   - › To proceed to unload, press STOP
   - › If more fluid needs to drain, press GO.

If you are draining a partial batch

The PureFlow SL assumes you are draining a full 60 L batch, which takes 3.5 hours. Depending on the amount of fluid left to drain, you may stop the drain mode before the control panel shows the message “`Drain Complete.`”

1. Press **STOP** to pause the drain.
2. Press and hold **STOP** to end the drain.

Performing final flush

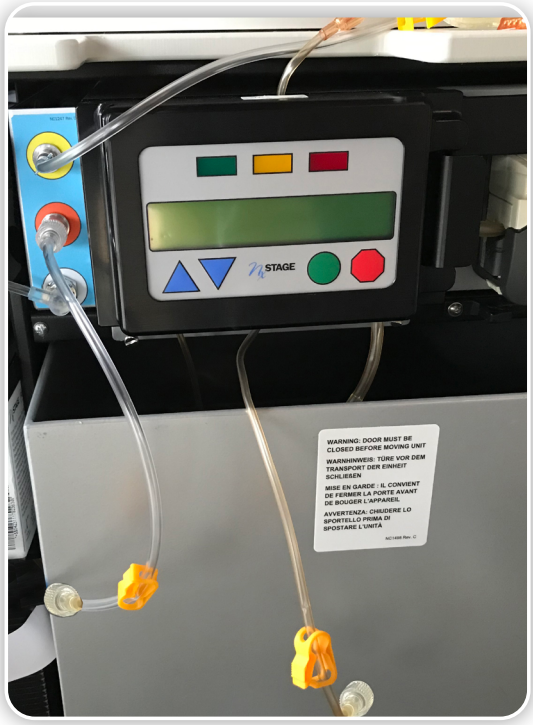
1. Turn the cold water on.
2. Press **STOP** on the PureFlow SL.
   - › The control panel shows the message
     “`DRAIN TR:hh:mm`
     `Flushing...”.`

Unloading the SAK

After the final flush completes, the PureFlow SL enters UNLOAD mode.

› The control panel shows the message "UNLOAD Close Blue Clamps".

1. Close the three blue clamps on the water lines that connect the PAK to the SAK, including the non-reopening blue clamp.
2. Disconnect the SAK water inlet line (blue clamp) from the PAK water outlet line (blue clamp), leaving the short line segment on the PAK line as a cap to prevent contamination.
3. Close the orange clamp on the conductivity sensor line and the orange clamp on the condo adapter and disconnect the line.
4. Press **GO** .
   › The control panel shows the message "UNLOAD Open Door; Remove SAK".
5. Open the control panel door and then the dialysate pump cover.
6. Remove the lines from the dialysate pump and the control panel channels.
7. Close the dialysate pump cover.
8. Close the control panel door.
   › The PureFlow SL returns to STANDBY mode and is ready to make a new batch.
9. Remove and discard the SAK.



Open the tub to remove the SAK

Maintenance

Although maintenance requirements are minimal, clean and disinfect the exterior surfaces after each treatment.

Note: Remember to use universal precautions when cleaning dialysis equipment.

Cleaning the PureFlow SL

1. Power off system.
2. Disconnect the equipment from its power source.
3. Make sure all disposables are removed from the equipment.
4. Open the PureFlow SL cabinet and pull out the tub.
5. Use a paper towel and mild detergent such as dishwashing liquid to clean all exterior surfaces. Follow the detergent manufacturer's cleaning instructions.

Note: Avoid touching the metal connections on the back of the PureFlow SL when cleaning. Do not pour solution onto or allow fluid to drip into the equipment.

6. Throw away used cleaning supplies and personal protective equipment appropriately.
7. For storage, make sure cabinet door is closed.

Disinfecting the PureFlow SL

If the equipment is contaminated with blood or suspected of being contaminated with pathogenic microorganisms (bacteria, virus, or fungi), disinfect it using a bleach solution.

Refer to "Maintaining the cycler" on page 34 for additional information.

1. Prepare a bleach solution according to the table below.

Sodium Hypochlorite Concentration	Water-To-Bleach Solution
5.0% - 5.9%	Add 16 oz water and 2 oz household bleach
6.0% - 6.9%	Add 20 oz water and 2 oz household bleach
7.0% - 7.9%	Add 24 oz water and 2 oz household bleach
8.0% - 8.9%	Add 28 oz water and 2 oz household bleach

Note: Most common household bleaches have a concentration of 5.25%-6.15% sodium hypochlorite. Refer to the product label for the actual strength of the product.

2. Moisten a soft cloth with the bleach solution.
3. Clean all visible blood or contamination.
4. Allow the solution to remain in contact with the exterior surface for 10 minutes.
5. Use a new soft cloth and water to rinse off the bleach solution.
6. Allow the surface to air dry.



Maintaining the air filter

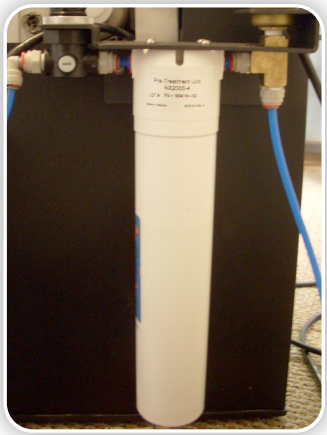
- Clean or replace the PureFlow SL's air filter every three months.
- Follow the instructions in the *PureFlow SL User Guide.*



Location of the air filter on the back of the control unit

Replacing the sediment filter

- Replace the sediment filter annually or more frequently as needed.
- Follow the instructions in the *PureFlow SL User Guide.*
- Write the installation date on the sediment filter as a reminder.



Flushing the drain line

Flush the drain line monthly or more frequently as needed. If using the drain line cleaning kit provided by NxStage, refer to the package instructions for use.

Do the following while the PureFlow SL is in STANDBY mode or as part of the recovery from an alarm:

1. Fill a 60 mL syringe (or two 30 mL syringes) with a 1:10 bleach solution.
2. Attach a recirculation connector (female-female adapter) to the syringe.
3. Connect the recirculation connector that is attached to the syringe to the waste line adapter on the control unit.

4. Open the yellow clamp on the waste line adapter.
5. Push 60 mL of bleach solution into the waste line adapter.
6. Reset the drain line by disconnecting and then reconnecting the quick disconnect for the black drain line at the rear of the control unit.
7. Allow the solution to stay in the waste line for 5–10 minutes.
8. Fill the syringe with 60 mL of tap water.
9. Connect the recirculation connector that is attached to the syringe to the waste line adapter.
10. Push the tap water into the waste line connector.
11. Repeat the rinse with an additional 60 mL of tap water.

Collecting water and dialysate samples

All water samples must be properly stored, packaged, and shipped according to the testing lab's instructions.

Both source water and product water must be tested as follows:

- **Source water:** Send a source water sample for testing before use begins to determine if the PureFlow SL can be used and if the LINX system should be used as well.
- **Product water:** Test product water when the PureFlow SL is installed and produces the first batch. After the initial test, repeat the test once a year.

When should the product water be tested?

- **Initial test:** Obtain this sample within four hours after making the first batch. Take the sample when the chloramines test has passed and "`Batch Use: 60`" is shown on the control unit.
- **Annual test:** Collect this sample near the end of PAK life, preferably after the Caution 5, "`Last Batch Caution`" is shown on the control unit.

Collecting a product water sample

Note: Remember to follow aseptic technique.

1. Prepare the following supplies:
   - Sterile female-female adapter
   - Gloves
   - Clean drape
   - Sterile 30 mL syringe
   - Testing container
   - Alcohol prep pad











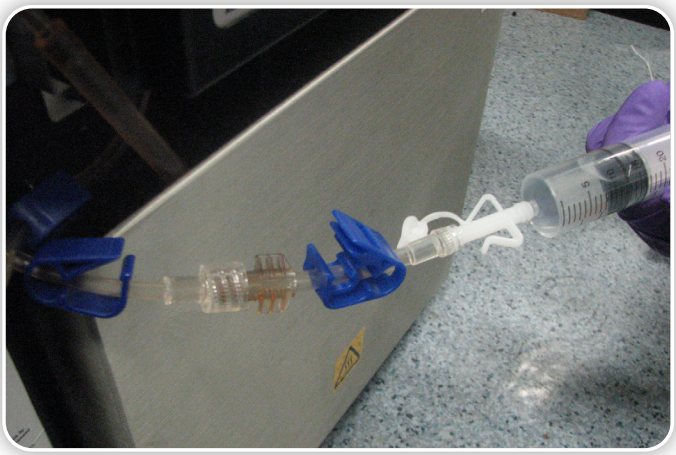


2. Connect a sterile female-female adapter to a sterile 30 mL syringe.
3. Close the two blue clamps on either side of the blue non-reopening clamp on the water line connecting the PAK to the SAK.
4. Disconnect the SAK inlet line from the PAK, leaving the short line segment with the blue non-reopening clamp on the PAK water outlet line.
5. If you plan to make a batch after obtaining the sample, place the SAK water inlet into an opened alcohol prep pad.



Close these blue clamps

6. Attach the open end of the sterile female-female adapter to the disconnected PAK water outlet line.
7. Open the blue reopening clamp on the PAK water outlet line and pull back on the syringe to obtain a 30 mL product water sample from the PAK.
8. Close the blue reopening clamp on the PAK water outlet line to the left of the blue non-reopening clamp.
9. Disconnect the syringe and inject the product water sample into the appropriate specimen container supplied by your center.
10. Repeat steps 2 - 9 as needed to collect the required volume of product water.
11. Disconnect the syringe and set it aside.
12. Reconnect the SAK water inlet line to the PAK water outlet line (blue to blue connection).
13. To use the batch for a treatment, follow the instruction for ”Using a batch” on page 57.



Collect the product water sample

Collecting a dialysate sample

Collect a dialysate sample near or at the end of SAK life. Remember to do the following:

- Follow strict aseptic technique to prevent sample contamination.
- Follow your testing lab's procedures for storage, packaging, and shipping specimens.
- Collect the sample when you still have at least one unused dialysate outlet line. The dialysate sample will be taken from an unused dialysate outlet line.

1. Prepare the following supplies:
   - Gloves
   - Clean drape
   - Mask
   - Alcohol prep pad
   - Dialysate testing kit (DTK-001) or sterile specimen container











2. Check that your PureFlow SL has been paused.
   - The control panel shows the message
     "XXL BATCH IN USE
     Paused TR:hh:mm"
3. Press **GO** on the PureFlow SL.
   - The control panel shows the message
     "XXL BATCH IN USE
     Batch Expires: hh:mm"
4. Close the green clamp on the dialysate outlet line of the SAK below the 1.2 micron filter.
5. Put the mask on, wash your hands, and put on gloves.

Note: Everyone else in the room must also wear a mask.

6. Prepare a clean field using a disposable drape.
7. Open an alcohol swab package.
8. Carefully remove the protective cap on the remaining unused dialysate outlet line and put the cap (clean side first) inside the alcohol swab package.

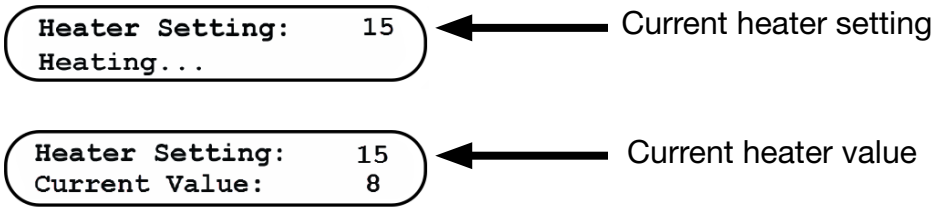
If using the DTK-001:	If using a sterile specimen container:
▪ Remove the cap from the DTK-001 line with the green non-reopening clamp. ▪ Connect the line to the unused connection on the dialysate outlet line.	▪ Open the container and place the lid sterile side up on the clean drape.

9. Open the dialysate outlet line below the 1.2 micron filter and allow the required volume of dialysate to pump into the DTK-001 sample bag or specimen container.
10. When you've collected the required volume of dialysate, close the clamp on the dialysate outlet line before the 1.2 micron filter.
11. Close the green non-reopening clamp on the DTK-001 line.
12. Disconnect the DTK-001 line from the dialysate outlet line.
13. Remove the protective cap that was stored in the alcohol swab package and place it on the end of the dialysate outlet line.
14. If you are not planning on using this outlet connection for treatment, close the green non-reopening clamp on the line with this outlet connection.
15. Immediately prepare the dialysate sample for shipment following the guidelines of your testing laboratory.

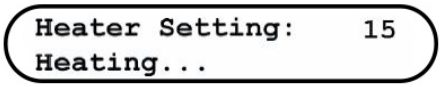
Supplemental procedures

Adjusting the heater setting

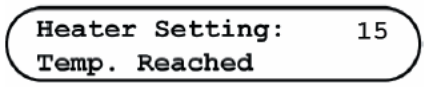
1. Press the **UP** ▲ or **DOWN** ▼ arrow on the control panel to go to the heater setting.
   - › The control panel displays the current setting:



   - › The display alternates between the two screens approximately every five seconds.
   - › The heater does not turn on until there is enough fluid in the SAK.
   - › If you select **0**, the heater is turned off.
2. Press the **UP** ▲ or **DOWN** ▼ arrows to adjust the heater setting from **0** to **20**.
   - › When there is enough fluid, the heater turns on. The control panel displays the following when you are in heater setting.



   - › When the dialysate reaches your desired heater setting, the control panel displays the following while in heater setting.



3. Press **GO** ● or wait three seconds to return to the previous display.

Changing the SAK type

To change the SAK type, the PureFlow SL must be in STANDBY mode.

1. Press and hold **STOP** ■ to go to STANDBY mode.
2. Press and hold the **DOWN** ▼ arrow to go to USER MAINTENANCE mode.
3. Press **GO** ● to enter **Settings**.
4. Press **GO** ● to enter **Change SAK Type**.
5. Press the **UP** ▲ or **DOWN** ▼ arrows to select the SAK type.
6. Press **GO** ● to confirm the SAK type.
7. Press and hold **STOP** ■ until the PureFlow SL starts the self-test.
   - › After the self test is completed, the PureFlow SL returns to STANDBY mode.

Pausing the PureFlow SL

1. Press **STOP** .
   - › To resume, press **GO** .
   - › If you are resuming using a batch, press **GO** again.

Draining the PureFlow SL

1. Press **STOP** to pause.
2. Press and hold **STOP** until the display shows the message `Cont: GO  To Drain: STOP.”`
3. Press **STOP** to enter DRAIN mode.
4. Press **GO** to begin draining the SAK.

Removing the PAK

1. Open the cabinet door on the front of the PureFlow SL.
2. Close the white clamp on the water inlet line.
3. Close the blue re-opening clamps on the water outlet line.

Note: Do not close the blue non-reopening clamp.

4. Close the orange clamp on the condo adapter line, if the PAK water inlet line is connected to the condo adapter line.
5. Disconnect all PAK fluid connections from the front of the control unit and the SAK.
6. Disconnect the PAK electrical connector from the side of the control unit.
7. Lift up the front end of the PAK so that it clears the lip at the front of the compartment, and then slide out the rest of the PAK.

Draining the SAK manually

If the PureFlow SL does not drain automatically, manually drain the SAK using one of the following methods.

Drain the SAK from the user maintenance menu:	Manually drain the SAK:
a. Press and hold **STOP** to go to STANDBY mode. b. Press and hold the **DOWN** arrow until the control panel displays "`USER MAINTENANCE Settings.`" c. Press the **DOWN** arrow until the control panel displays "`USER MAINTENANCE Drain.`" d. Press **GO** to drain.	▪ Refer to the *PureFlow SL User Guide*.

Removing the control unit

1. Press and hold **STOP** to go to STANDBY mode.
2. Shut off the power.
3. Disconnect the power cord.
4. Close the clamps on all the fluid lines.
5. Disconnect all the connections from the front and the back of the control unit.
6. Disconnect the PAK's electrical connector from the side of the control unit.
7. Loosen the two thumb screws located under the front of the control unit.
8. Slide the control unit forward to remove it.

Replacing the LINX DI Cells

1. Put the LINX is in BYPASS mode.
2. Position the tip of the blue unit connector over a drain or a bucket.
3. Press down on the tip of the unit connector to release a short burst of air and water to depressurize the system.
4. Remove one blue DI cell cover and set it aside.
5. Securely attach the wrench from the DI Cell Replacement Kit to the DI cell.
6. Turn the wrench left for two turns.
7. Slowly lift the DI cell from the LINX and set it aside.
8. Use the pipette from the replacement kit to remove the water from the empty cell housing.
9. Remove the DI cell top and install it on the new DI cell securely.
10. Place the new DI cell into the empty cell housing.
11. Turn the DI cell to the right to hand-tighten.
12. Use the wrench to turn the DI cell to the right until the top aligns with the seam on the LINX unit.
13. Replace the blue DI cell cover.
14. Turn to the blue DI cell cover left until it is tight to the housing.
15. To replace the second LINX DI cell, repeat the above steps 4 through 14.



Chapter 5: How do I troubleshoot common alarms?

Chapter Overview

Introduction: troubleshooting red alarms & yellow cautions 74

Common cycler alarms and cautions at a glance 75

Common PureFlow SL alarms at a glance 79

Standard response for cycler alarms and cautions 80

Responding to cycler air alarms and cautions during TREATMENT mode 81

Monitoring pressure alarms 86

Special conditions 90

Responding to warmer alarms 93

Responding to PureFlow SL alarms and cautions 94

Responding to PureFlow SL alarms during PAK PRIME 95

Responding to PureFlow SL alarms when making a batch 97

Responding to other PureFlow SL alarms 99

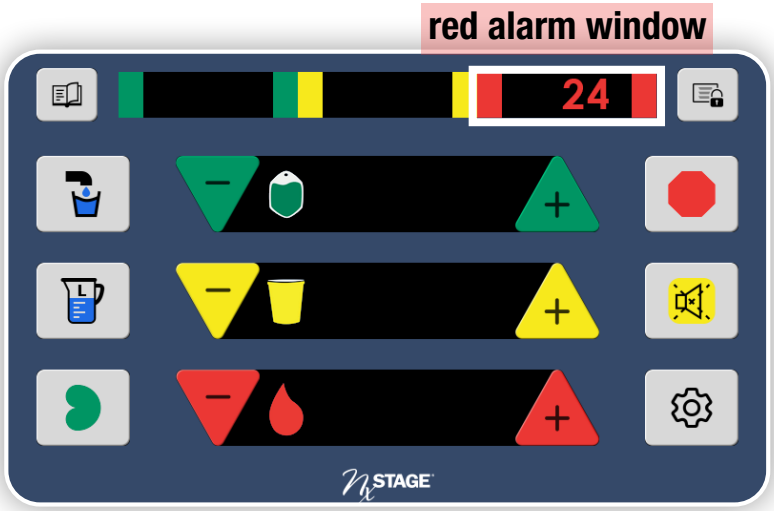
Introduction: troubleshooting red alarms & yellow cautions

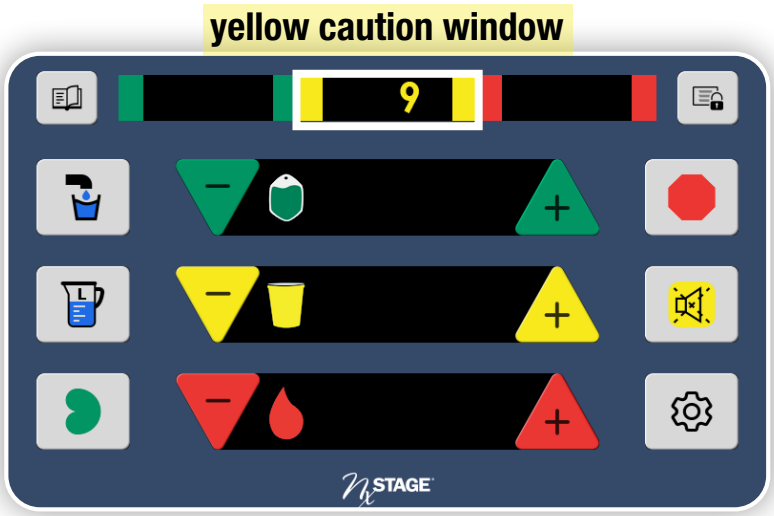
The NxStage systems are designed to deliver a safe, smooth, and comfortable treatment. However, there may be times when actions are required to remedy red alarms and yellow cautions. This guide describes the steps necessary to respond promptly to the most common alarms and cautions.

Note: Only the top three or four most common causes and operator actions are included. Refer to the User Guides for a complete listing of all the alarms and cautions, and all the causes and operator actions.



- When an alarm or caution occurs, an audible sound will be heard.
- A number will appear in the red alarm window or yellow caution window.
- The number displayed identifies the specific condition that may require operator action.





Common cycler alarms and cautions at a glance

The alarms in this quick reference guide are the most common cycler and PureFlow SL alarms. Only the most common causes and operator actions are included. Refer to the user guide for a complete listing of all alarms and cautions, and all the causes and operator actions.

Tap the **HELP** icon  on the cycler control panel to show the caution or alarm name.

Caution/Alarm Number	Caution/Alarm Name	Probable Causes
Caution 2	Fluid Balance System Check Underway	▪ The system is conducting a normal automated fluid balancing system check, which takes about two minutes.
Caution 3	Parameter Limit Exceeded	▪ A setting is too low or too high.
Caution 4	Blood Pump Off	▪ The blood pump is stopped.
Caution 7	Alarms Overridden	▪ Some alarms are temporarily overridden.
Caution 8	Pressure Limits Not Locked	▪ Pressure limits are not locked after a flow rate change.
Caution 9	Automated High Pressure Recovery	▪ Pressure-related alarm recovery.
Alarm 10	Check for Venous Air during TREATMENT	▪ Air that wasn't completely removed from the dialyzer venous header. ▪ Air is in the blood circuit or patient blood lines because they weren't snapped and tapped. ▪ Loose arterial connections.

Caution/Alarm Number	Caution/Alarm Name	Probable Causes
Alarm 11	Check for Arterial Air during TREATMENT	▪ Poor flow through the arterial access site. ▪ The needle changed position. ▪ Loose, disconnected, or clamped venous blood line. ▪ Air in saline line because the saline bag is empty.
Caution 12	Air Recovery Underway	▪ Air recovery following a red air alarm.
Caution 14	Check Fluid Line Inlet: Air Detected in Fluid Line Inlet	▪ The dialysate source fluid volume is low or the bag is empty. ▪ Blocked, kinked, or clamped dialysate line(s). ▪ Loose dialysate line connections.
Alarm 20	Check Blood Circuit: Venous Pressure Low	▪ The blood flow rate is lower than the prescribed rate. ▪ A venous needle is dislodged. ▪ A manual fluid bolus was delivered. ▪ The venous blood line is disconnected.
Alarm 24	Check Arterial Access: Access Pressure at Low Limit	▪ The arterial access flow problem. ▪ The venous blood line is kinked or clamped.
Caution 25	Access Pressure Pod Error: Reset Access Pressure Pod	▪ The access pressure pod monitoring line is disconnected or poorly connected. ▪ The access pressure pod monitoring line is kinked.

Caution/Alarm Number	Caution/Alarm Name	Probable Causes
Alarm 30	Check Blood Circuit: Venous Pressure High During TREATMENT	▪ The blood flow rate is too high for the vascular access. ▪ The venous blood line is kinked or clamped. ▪ Infiltration in the venous access.
Alarm 35	Check Waste Line: Waste Line Pressure High	▪ The waste or drain line is kinked, clamped, pinched, blocked, submerged, or not connected ▪ The PureFlow SL drain line is clogged.
Alarm 37, 38, 39	Check Fluid Circuit: High Balance Chamber Pressure During TREATMENT	▪ Blocked, kinked, or clamped fluid line(s). ▪ Empty or low dialysate source. ▪ If using PureFlow SL, one of the following has happened: › **TREATMENT** was pressed on the cycler before **GO** was pressed on the PureFlow SL. › There is insufficient volume in the SAK. › The drain line is clogged.

Caution/Alarm Number	Caution/Alarm Name	Probable Causes
Caution 40	Perform Power Recovery: Power Failure	▪ Previous loss of power to the cycler.
Alarm 41	Failed Power Recovery	▪ Previous loss of power to the cycler during treatment or rinseback mode for longer than the time allowed. ▪ The cycler door was opened during a power failure or while the cycler power was turned off during treatment or rinseback mode and remained open when the power returned.
Alarm 50	Check Fluid Temp: Fluid Temp High	▪ Heating setting is too high on the fluid warmer. ▪ Dialysate bags are too warm prior to set up. ▪ Treatment environment is too warm.
Alarm 60	Check For Blood Leak: Blood Detected in Waste Line	▪ Dialyzer fiber leak. ▪ Air is in the effluent or the flow fraction is set too high. ▪ The ultrafiltration rate is at zero (0).

Common PureFlow SL alarms at a glance

Caution/Alarm Number	Caution/Alarm Name	Probable Causes
Alarm 12	PAK Exhausted	▪ The PAK is no longer usable.
Alarm 43	Conductivity Test Failed	▪ Incorrectly set SAK type. ▪ Kinked green line collar assemblies on the SAK lines. ▪ The drain line not properly connected. ▪ The drain line is blocked.
Alarm 44	No Flow Detected Through Conductivity Line	▪ No flow through the conductivity line due to a closed clamp, kinked, pinched, disconnected, or improperly connected line.
Alarm 50	Inlet Pressure Low	▪ Low source water pressure. ▪ Water is not turned on. ▪ The water inlet line (blue line from source water to PureFlow SL) is kinked or improperly connected.
Alarm 51	Output Pressure High	▪ A SAK line is closed, or the line is kinked, or improperly connected. ▪ The SAK is not loaded correctly. ▪ During PAK prime, the PAK water inlet is not correctly connected to the Control Unit; PAK lines and/or clamps are not open.
Alarm 52	Fluid Leak in Control Unit	▪ Fluid leak in the control unit.
Alarm 53	Fluid Leak in Tub	▪ Loose connections that are causing a leak.
Alarm 54	Fluid Leak in PAK	▪ Fluid leak in the PAK.
Alarm 833	J1 Connection Loose	▪ J1 connection on the back of the unit is loose or disconnected.

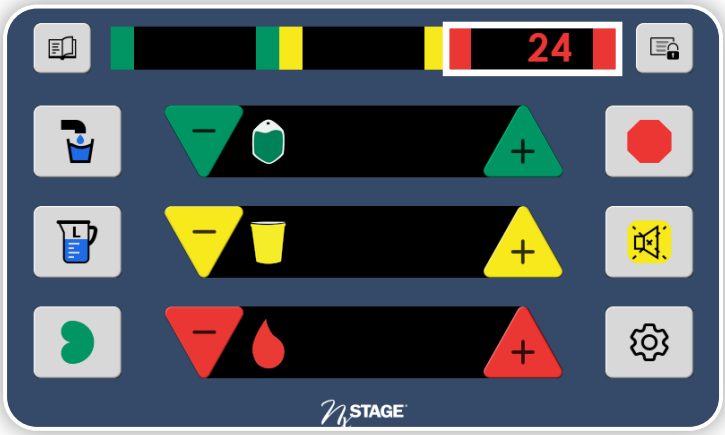
Standard response for cycler alarms and cautions

There are standard actions to take when responding to cycler cautions and alarms.

Note: Always be sure that the green operating window information returns after resolving an alarm or caution.

Standard response to cycler alarms

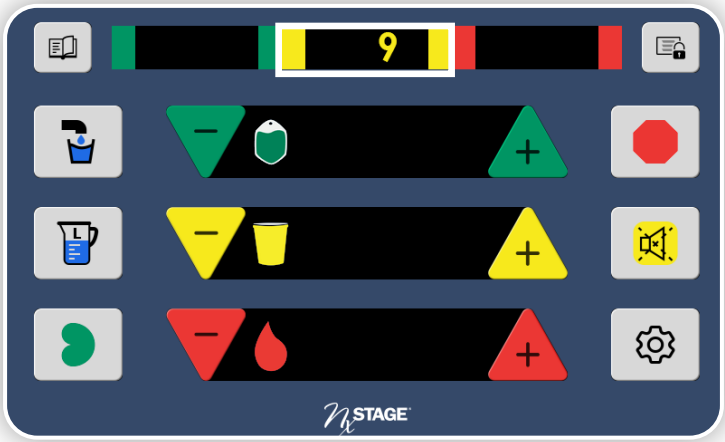
1. Locate the alarm number in the red alarm window.
2. Tap **MUTE** to silence the alarm.
3. Identify the cause and fix it.
4. Tap **STOP** on the cycler.
5. Tap **TREATMENT** if in TREATMENT mode; tap **ADD FLUID** if in PRIME or RINSEBACK mode.
6. If unable to resolve an alarm after several attempts, do one of the following:



For balance chamber alarms (Red alarms 35, 37, 38, 39)	For all other alarms:
1. Press and hold **STOP** . › The blood pump starts to run at the treatment rate. 2. When you resolve the cause, tap **TREATMENT** to resume the treatment.	If you cannot resolve the cause: ▪ Tap **STOP** to end the treatment and begin rinseback.

Standard response to cycler cautions

1. Locate the caution number in the yellow caution window.
2. Identify the cause and fix it.
3. Tap **TREATMENT** if in TREATMENT mode; tap **ADD FLUID** if in PRIME or RINSEBACK mode for cautions that require action.
4. Tap **MUTE** to silence cautions that only provide information.



Responding to cycler air alarms and cautions during TREATMENT mode

Caution 4: Blood Pump Off Caution

If **TREATMENT** has not been pressed after a RED alarm condition is resolved, you see a Caution 4. This indicates the blood pump is off.

1. Tap **MUTE** to silence the caution.
2. Identify and fix the probable cause(s).

Check for	Do
STOP was pressed during treatment and the blood pump stopped. The blood flow rate is zero (**0**).	1. If you are using an external infusion pump, turn it off. 2. Tap **TREATMENT** to continue the treatment OR Tap **ADD FLUID** to continue to RINSEBACK mode. 3. If you are using an external infusion pump, turn it on.

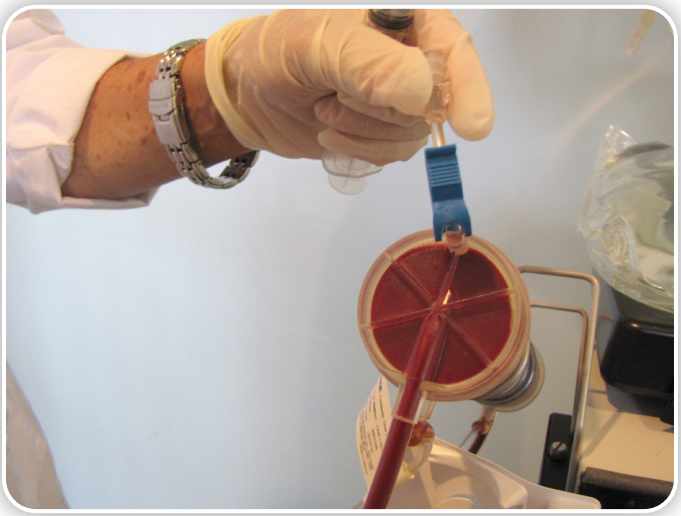
Note: The risk of clotting increases when the blood pump is stopped for a long time.

Alarm 10: Check for Venous Air During TREATMENT

1. Tap **MUTE** to silence the alarm.
2. Identify and fix the probable cause(s).

Check for	Do
Air that wasn't completely removed from venous header.	Remove air from the venous header.
Air in the blood circuit or in the blood lines because they weren't snapped and tapped correctly.	Remove air from the venous lines.
Loose arterial connections.	Tighten and secure the connections.

3. Tap **STOP** on the cycler.
4. Attach a 20 mL luer lock syringe to the post-dialyzer port.
5. Open the blue clamp on the port and slowly pull back on the luer lock syringe to remove air.
6. Hold the syringe upright to allow the air bubbles to rise.
7. Inject the blood back through the post-dialyzer port.
8. Close the blue clamp on the port securely.



9. Tap **TREATMENT** on the cycler.

   › The cycler displays Yellow Caution 12.

10. Watch the blood as it returns to the patient, looking for any air in the venous blood line (blue clamp).

    › The blood pump runs slowly (50 mL/min) to allow you to observe for air.

If air is seen in the venous blood line:	If no air is seen:
a. Tap **STOP** on the cycler. b. Repeat steps 4 through 9. c. If you cannot remove air from the venous patient line, tap **STOP** and end the treatment. d. Do not rinse back blood if you see air in the patient blood lines.	a. Tap **TREATMENT** to return the blood pump to the programmed rate. b. Flush the post-dialyzer port with 3 mL of saline. c. Close the blue clamp on the port securely.

Alarm 11: Check for Arterial Air During TREATMENT

1. Tap **MUTE** to silence the alarm.
2. Identify and fix the probable cause(s).

Check for	Do
Poor flow through arterial access flow site.	Re-establish or adjust the access.
Change in needle position.	Reposition the needle.
The arterial blood line is loose, disconnected, or a clamp is closed.	Tighten, reconnect, or open the clamp on the arterial blood line.
Air in saline line because the saline bag is empty.	Replace the empty saline bag with a new bag.

3. Tap **STOP** on the cycler.
4. Tap **TREATMENT** on the cycler.
   - › The cycler displays Yellow Caution 12.
   - › The blood pump runs slowly (100 mL/min).
   - › Continue to watch the venous patient blood line (blue clamp) for air.
5. Attach a 20 mL luer lock syringe to the post-dialyzer port.
6. Tap **TREATMENT** on the cycler.
   - › The blood pump returns to the prescribed blood flow rate.
7. If you see air in the venous header, open the blue clamp on the port.
8. Slowly pull back on the luer lock syringe to remove the air.
9. Hold the syringe upright to allow the air bubbles to rise.
10. Inject the blood back through the post-dialyzer port.
11. Close the blue clamp on the port securely.
12. Flush the post dialyzer port with 3 mL of saline.
13. Close the blue clamp on the port securely.
14. Continue to check the venous header for air and remove air as needed.

Note: If this alarm occurs again, lower the blood flow rate, as the arterial access may not be able to deliver the set blood flow.

Caution 14: Check Fluid Line Inlet, Air Detected in Fluid Line Inlet

1. Tap **MUTE**  to silence the caution.
2. Identify and fix the probable cause(s).

Check for	Do
A low fluid volume or empty dialysate source.	Add more dialysate.
The dialysate line is blocked, kinked, or a clamp is closed.	Clear, unkink or open the clamps on the line(s).
Loose dialysate line connections.	Tighten or secure the connections.

3. Tap **TREATMENT**  on the cycler.

Monitoring pressure alarms

It is important to monitor abnormal arterial and venous pressures to address access flow issues and prevent alarms.

Alarm 20: Check Blood Circuit, Venous Pressure Low

1. Tap **MUTE** to silence the alarm.
2. Identify and fix the probable cause(s).

Check for	Do
A blood flow rate that is lower than the prescribed rate.	Increase the blood pump rate.
A dislodged venous needle.	Secure the venous blood line or access.
A manual fluid bolus was delivered.	Resume prescribed blood flow.
A disconnected venous blood line.	Reconnect the venous blood line.

3. Tap **STOP** on the cycler.
4. Tap **TREATMENT** on the cycler.

Alarm 24: Check Arterial Access, Access Pressure at Low Limit

1. Tap **MUTE** to silence the alarm.
2. Identify and fix the probable cause(s).

Check for	Do
Arterial access flow problem.	Reposition the access, adjust the needle, or reduce the blood flow.
A clamp is closed on the arterial blood line or the line is kinked.	Open the clamp on the line or unkink the line.

3. Tap **STOP** on the cycler.
4. Tap **TREATMENT** on the cycler.

Caution 25: Access Pressure Pod Error, Reset Access Pressure Pod

1. Tap **MUTE**  to silence the caution.
2. Identify and fix the probable cause(s).

Check for	Do
Disconnected or poorly connected access pressure pod monitoring line.	Follow steps 3-10 to reset the access pressure pod.
Kinked access pressure pod monitoring line.	Unkink the monitoring line on the access pressure pod, skip to step 11.

3. Detach the access pressure pod monitoring line from the cycler.
   - › The access pressure pod deflates.
4. Tap **STOP**  on the cycler.
   - › If the pod fills immediately, skip to step 9.
   - › If the pod does not fill immediately, go to step 5.
5. Close the red clamp on the arterial blood line.
6. Open the white clamps on the saline line and saline “T.”
7. When the pod diaphragm fills with blood, close the white clamps.
8. Open the red clamp on the arterial blood line.
9. Attach the access pressure pod monitoring line to the cycler.
10. Tap **TREATMENT**  on the cycler.
11. Confirm that arterial pressures are within range.

Alarm 30: Check Blood Circuit, Venous Pressure High During TREATMENT

1. Tap **MUTE** silence the alarm.
2. Identify and fix the probable cause(s).

Check for	Do
The blood flow rate is too high.	Decrease the blood flow rate.
The venous blood line is kinked or clamped.	Unkink or open the clamps on the line.
Venous access infiltration.	Correct infiltration.

3. Tap **STOP** on the cycler.
4. Tap **TREATMENT** on the cycler.

Alarm 35: Check Waste Line, Waste Line Pressure High

1. Tap **MUTE** to silence the alarm.
2. Identify and fix the probable cause(s).

Check for:	Do
The waste or drain line is kinked, pinched, blocked, submerged, or not connected.	Correct the lines to ensure that the waste fluid is flowing freely.
A clamp is closed on the waste or drain line.	Open the clamp.
Clogged PureFlow SL drain line.	Switch to disposable waste line extension.

3. Tap **STOP** on the cycler.
4. Tap **TREATMENT** on the cycler.
5. **If you need more time to resolve this alarm,** follow the instructions “For balance chamber alarms (Red alarms 35, 37, 38, 39)” on page 78.

   If you cannot resolve the cause:

   › Tap **STOP** to end the treatment and begin rinseback.

Alarm 37, 38, 39: Check Fluid Circuit, High Balance Chamber Pressure During TREATMENT

1. Tap **MUTE** to silence the alarm.
2. Identify and fix the probable cause(s).

Check for	Do
A clamp is closed on the dialysate or waste line.	Open the clamps.
The dialysate or waste lines are blocked or kinked.	Clear or unkink the lines.
Empty or low dialysate source.	Add more dialysate.
If using the PureFlow SL, **TREATMENT** was pressed on the cycler before **GO** was pressed on the PureFlow SL.	Verify that the PureFlow SL is in "Batch in Use". If not, do the following: a. Press **GO** twice on the PureFlow SL. b. Tap **TREATMENT** on the cycler.
Insufficient SAK volume when using the PureFlow SL.	End the treatment, rinse back the blood, following your center's instruction.
Clogged PureFlow SL drain line.	Switch to the disposable waste line extension.

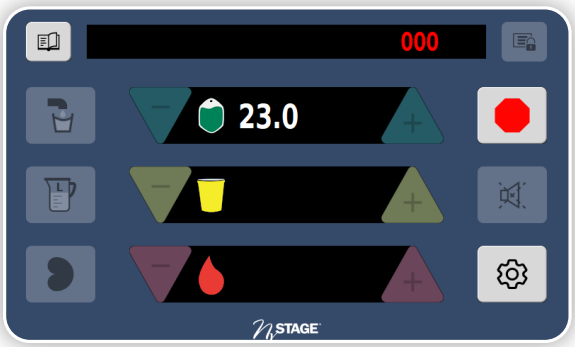
3. Tap **STOP** on the cycler.
   - › The number **9** appears in the yellow caution window.
   - › **Do not tap STOP** again.
4. Tap **TREATMENT** on the cycler.
   - › The treatment automatically resumes when the Yellow Caution 9 disappears.
5. **If you need more time to resolve this alarm,** follow the instructions "For balance chamber alarms (Red alarms 35, 37, 38, 39)" on page 78.

   If you cannot resolve the cause:
   - › Tap **STOP** to end the treatment and begin rinseback.

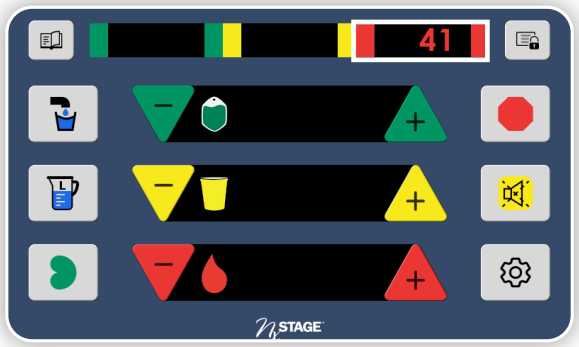
Special conditions

Caution 40: Perform Power Recovery: Power Failure

1. Tap **MUTE** to silence the caution.
2. Identify and fix the probable cause(s).

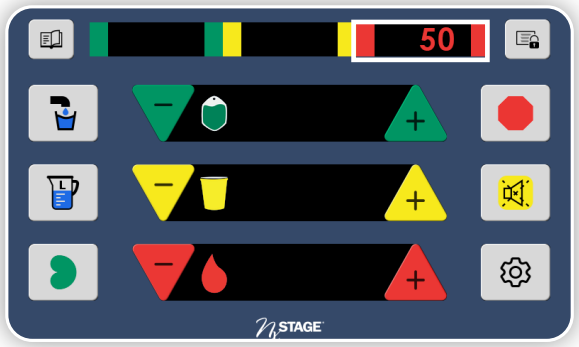
Check for	Do
 During the recirculation step of prime mode (**000** in red alarm window, **23.0** in the top window): › Power is restored following a power failure **or** › Cycler being turned off during recirculation and the cartridge life has not expired.	a. Tap **TREATMENT**. b. Monitor the cycler screen (20.0 to 23.0 in top window) indicating the system is rechecking the fluid balance system. c. When the number 23.0 appears, continue with the 'snap and tap' procedure to remove air.
During treatment or rinseback mode: Power is restored following a power failure or cycler being turned off for less than the preset number of minutes allowed.	In TREATMENT mode, tap **TREATMENT** to resume. In RINSEBACK mode, tap **TREATMENT** to resume.

Alarm 41: Failed Power Recovery



1. Tap **MUTE** to silence the alarm.
2. End the treatment.

Alarm 50: Check Fluid Temp, Fluid Temp High



1. Tap **MUTE** to silence the alarm.
2. Identify and fix the probable cause(s).

Check for	Do
The warmer or heater setting is too high.	Reduce the heater setting.
Dialysate bags that are too warm prior to set-up.	Cool or replace the dialysate bags.
Treatment environment that is too warm.	Cool the room.

3. Tap **STOP** on the cycler.
4. Tap **TREATMENT** on the cycler.

Caution 53: Low Fluid Temperature

1. Tap **MUTE** to silence the caution.
2. Identify and fix the probable cause(s).

Check for	Do
The fluid warmer is not turned on, is set too low or is not working.	Turn on the fluid warmer or increase the dialysate heater setting: ▪ If using the Express Fluid Warmer: › Press the **UP** arrow to increase the comfort setting. ▪ If using the PureFlow SL: › Refer to "Adjusting the heater setting" on page 67 to change the heater setting.
Dialysate bags that are too cold prior to set-up.	Allow the warmer enough time to warm the fluid. Press **TREATMENT** to continue. If the patient is experiencing discomfort, end the treatment.
The room temperature is too low.	Warm the room.

3. Tap **TREATMENT** on the cycler.

Caution 54: Low Temperature Monitor Disabled

1. Tap **MUTE** to silence the caution.
2. Identify and fix the probable cause(s).

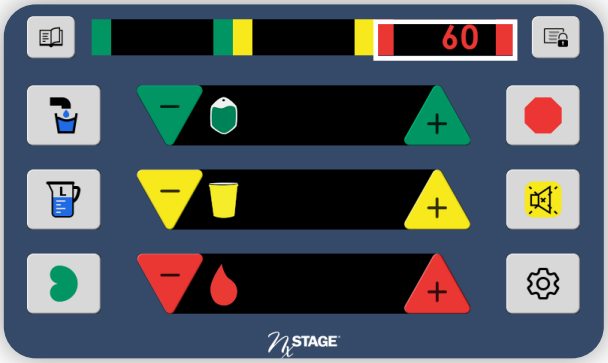
Check for	Do
System Setting #79 has been set to **0**.	Tap **MUTE** to acknowledge the caution.

Note: If low temperature monitoring should be enabled, see the instructions in "Changing system settings" on page 42 to change System Setting #79 to 1.

Alarm 60: Check for Blood Leak, Blood Detected in Waste Line

1. Tap **MUTE** to silence the alarm.
2. Identify and fix the probable cause(s).

Follow your center's instructions for testing waste fluid for the presence of blood:



Responding to warmer alarms

Standard response to an Express Fluid Warmer alarm

The following occurs during an alarm :

- All the comfort setting lights turn red.
- An alarm tone sounds.
- The heater is disabled.



1. Press either the **UP** ▲ or **DOWN** ▼ arrow to display the alarm code.
   - › The alarm code displays for ten seconds.
   - › The alarm code is determined by which comfort setting lights remain red.
2. Use the *Express Fluid Warmer User Guide* to identify the probable cause(s) and fix it.
3. Press the **UP** ▲ arrow to return to the treatment.
4. High fluid temperature could also cause an **Alarm 50: Cycler High Fluid Temperature.**

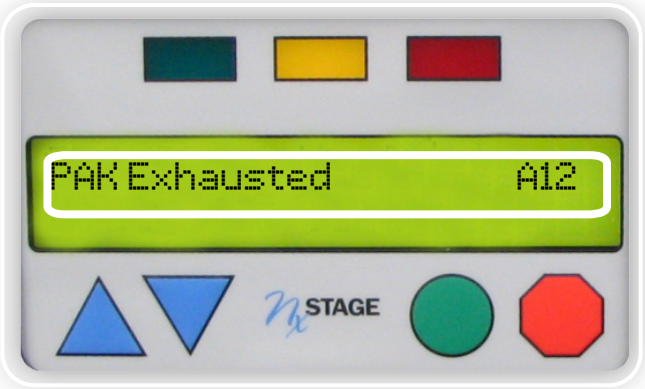
Responding to PureFlow SL alarms and cautions

Standard Response for PureFlow SL alarms and cautions

There are standard actions to take when responding to PureFlow SL alarms and cautions.

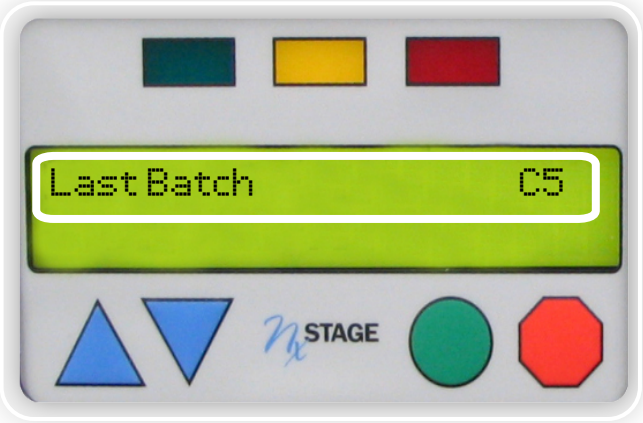
Standard Response to PureFlow SL alarms

1. See the red alarm light flashing and the alarm number and error message.
2. Press **STOP** .
3. Identify the cause and fix it.
4. Press **GO** .



Standard Response to PureFlow SL cautions

1. See the yellow caution light flashing and the error message.
2. Identify the cause and fix it.
3. Press **GO** .



Responding to PureFlow SL alarms during PAK PRIME

Alarm 12: PAK Exhausted, PAK is Exhausted and Cannot Be Used

1. Press **STOP**  .
2. Press **GO**  .
3. Install and prime new PAK. Refer to the instructions for “Priming a PAK” on page 51.

Alarm 50: Inlet Pressure Low

1. Press **STOP**  .
2. Identify and fix the probable cause(s).

Check for	Do
Low source water pressure or the water is not turned on.	Verify PureFlow SL is correctly connected to water source. Make sure water is turned on.
The water inlet line (blue line from source water to PureFlow SL) is kinked or not properly connected.	Unkink or connect line.

3. Press **GO**  .
4. If the problem continues, call NxStage Customer Service to order a replacement sediment filter.

Alarm 51: Output Pressure High

1. Press **STOP**  .

Check for	Do
A line that is kinked, improperly connected, or has a closed clamp.	2. Check all lines and look for kinks and closed clamps. Ensure that the following is true: ▪ The PAK water inlet (white elbow) is connected to white connector on the control unit. ▪ PAK outlet line (blue clamp) is connected to the conductivity connector (orange) on the control unit. ▪ All PAK clamps are opened. 3. Disconnect and reconnect the drain line.

4. Press **GO**  .
5. If the alarm continues, call NxStage Technical Support.

Alarm 54: Fluid Leak in PAK

1. Press **STOP**  .
2. Press **GO**  .
3. If the alarm continues:
   - › Remove the PAK.
   - › Dry the PAK leak sensor.
   - › Dry the bottom of the PAK.
   - › Reinstall the PAK.
4. If the alarm continues, call NxStage Technical Support.

Responding to PureFlow SL alarms when making a batch

Alarm 43: Conductivity Test Failed

1. Press **STOP**  .
2. Check the lines for closed clamps and kinks; open any closed clamps and correct any kinked lines.

Check for	Do
Incorrectly set SAK type.	Discontinue using the PureFlow SL and use bagged dialysate for treatment.
Kinked green line sleeves.	Unkink the lines.
The drain line is not properly connected.	Disconnect and reconnect the drain line.
The drain line is blocked.	Flush the drain line.

3. Push on the SAK to mix the fluid.
4. Press **GO**  to retry the test.
5. If the control panel displays "`Clamp Line With Blue Check Valve`," then close the clamp on the SAK fill line (the line with the blue check valve) with a non-serrated clamp.
6. Press **GO**  .
   - The PureFlow SL runs for approximately three minutes.
   - After about three minutes, the control panel displays "`Remove Clamp`."
7. Remove the clamp from the SAK fill line.
8. Press **GO**  to retry the test.
9. If the alarm continues, call NxStage Technical Support.

Alarm 44: No Flow Detected Through Conductivity Line

1. Press **STOP** .
2. Identify and fix the probable cause(s).

Check for	Do
The flow through the conductivity line is slow or blocked.	Check that the following are true: ▪ The conductivity line (orange) is connected to the conductivity sensor. ▪ The orange conductivity clamp is open. ▪ None of the SAK lines are kinked, pinched or have a closed clamp. ▪ The control unit drain line is connected and can drain. ▪ The SAK has unfolded properly.

3. Press **GO** .

Alarm 51: Output Pressure High

1. Press **STOP** .
2. Identify and fix the probable cause(s).

Check for	Do
A line that is kinked, improperly connected, or has a closed clamp.	Check that the following are true: ▪ All of the clamps are open and there are no kinks in any of the lines from the PAK and control unit to the SAK. ▪ The drain line is connected to the back of the control unit.

3. Press **GO** .
4. If the alarm continues, call NxStage Technical Support.

Responding to other PureFlow SL alarms

Alarm 833: J1 Connection Loose

1. Press **STOP** .
2. Identify and fix the probable cause(s).

Check for	Do
The J1 connection on the back of the unit is loose or disconnected.	Connect or secure the J1 connection on the back of the unit.

3. Press **GO** .

Notes:

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