

Keep Calm & Carry On



How do I troubleshoot
common alarms?

How do I recognize
a problem?

Disclaimer

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

You must review and refer to the NxStage cycler and PureFlow™ SL user guides and cartridge instructions for use for all instructions, warnings, and precautions.

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Chapter 1: How do I troubleshoot common alarms?

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Introduction: Troubleshooting red alarms & yellow cautions

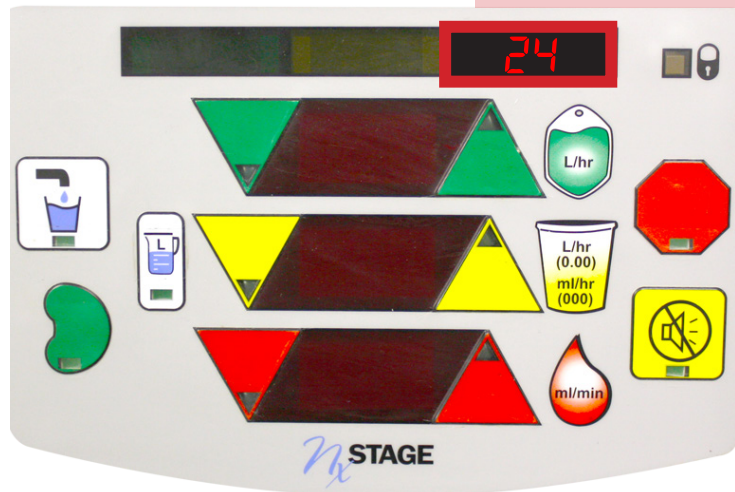
The NxStage systems are designed to deliver a safe, smooth, and comfortable treatment. However, there may be times when actions are required to remedy red alarms and yellow cautions. This guide describes the steps necessary to respond promptly to the most common alarms and cautions.

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.

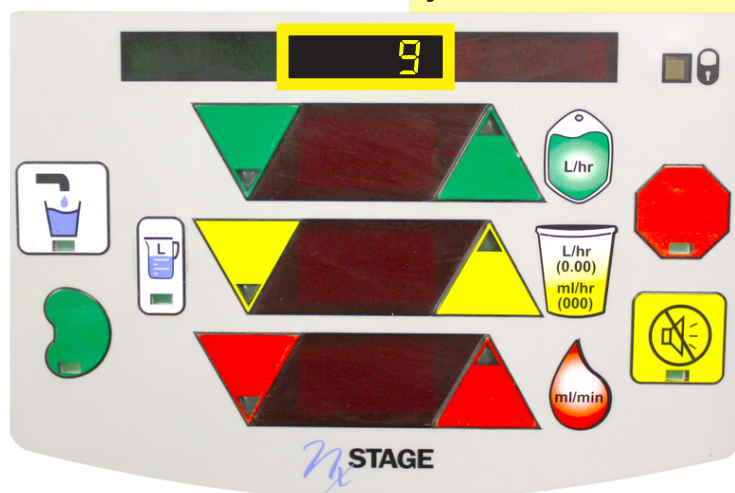


- When an alarm or caution occurs, an audible sound will be heard.
- A number will appear in the red alarm window or yellow caution window.
- The number displayed identifies the specific condition that may require operator action.

red alarm window



yellow caution window



Common cyclor alarms and cautions at a glance

NOTE: This table provides a quick summary of alarms and cautions according to their numbers, names, and potential causes. Additional information, including operator actions, is discussed in more detail in the following pages.

Caution/Alarm Number	Caution/Alarm Name	Probable Causes
 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 blood lines because they weren't snapped and tapped. ▪ Loose arterial connections.
 Alarm 11	Check for Arterial Air during TREATMENT	▪ Poor flow through the arterial access site. ▪ The needle changed position. ▪ Loose, disconnected, or clamped arterial blood line. ▪ Air in saline line because the saline bag is empty.
 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.

Caution/Alarm Number	Caution/Alarm Name	Probable Causes
 Alarm 24	Check Arterial Access: Access Pressure at Low Limit	▪ The arterial access flow problem. ▪ The arterial 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.
 Alarm 30	Check Blood Circuit: Venous Pressure High During TREATMENT	▪ The blood flow rate 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 cyclor 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 cyclor.
 Alarm 41	Failed Power Recovery	▪ Previous loss of power to the cyclor during treatment or rinseback mode for longer than the time allowed. ▪ The cyclor door was opened during a power failure or while the cyclor 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 alarms and cautions 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 clamp is closed, or the line is kinked, or improperly connected. ▪ The SAK is not loaded correctly. ▪ The PAK water inlet is not correctly connected to the Control Unit; PAK lines and/or clamps not open.
 Alarm 52	Fluid Leak in Control Unit	▪ Fluid leak in the control unit
 Alarm 53	Fluid Leak in Tub	▪ Loose connections 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.

This image shows a full page of blank, lined paper. It features approximately 20 evenly spaced horizontal blue lines across its entire width. The paper is otherwise completely empty, with no margins, text, or other markings.

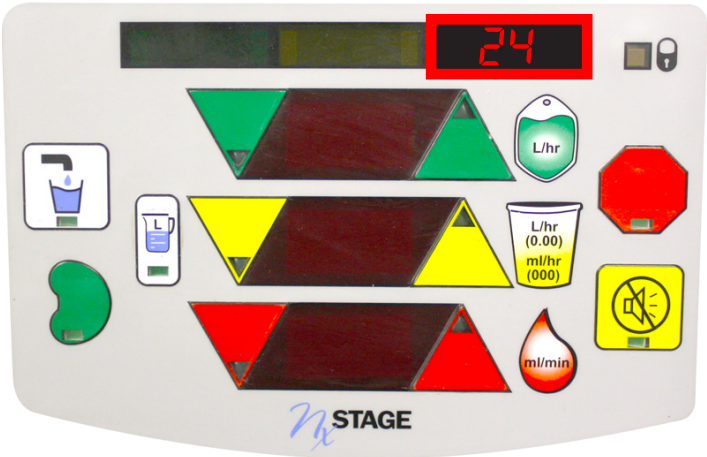
Standard response for cyclor alarms and cautions

There are standard actions to take when responding to cyclor cautions and alarms. Only the most common causes and operator actions are included here. Refer to the user guides for a complete listing of all the alarms and cautions and all the causes and operator actions.

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

Standard response to cyclor alarms

1. Locate the alarm number in the red alarm window.
2. Press **MUTE**  to silence the alarm.
3. Identify the cause and fix it.
4. Press **STOP**  on the cyclor.
5. Press **TREATMENT**  if in TREATMENT mode; press **ADD FLUID**  if in PRIME or RINSEBACK mode.

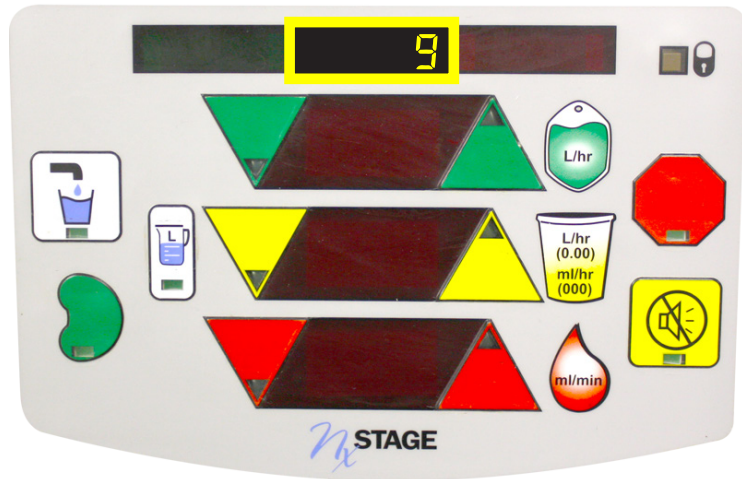


Note: If unable to resolve an alarm after several attempts, do one of the following:

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, press TREATMENT  to resume the treatment.	If you cannot resolve the cause: ▪ Press STOP  to end the treatment and begin rinseback.

Standard response to cyclor cautions

1. Locate the caution number in the yellow caution window.
2. Press **MUTE**  to clear cautions that only provide information (i.e. cautions 2, 7, 8).
3. To clear cautions that require an action (i.e. caution 4, 12, 14):
 - › Identify the cause and fix it.
 - › Press **TREATMENT**  if in TREATMENT mode; or press **ADD FLUID**  if in PRIME or RINSEBACK mode.



Responding to cyclor air alarms and cautions during TREATMENT mode

Caution 4: Blood Pump Off Caution

1. Press **MUTE**  to silence the alarm.
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. Press TREATMENT  if in TREATMENT mode; press ADD FLUID  if in PRIME or RINSEBACK mode 3. If you are using an external infusion pump, turn it on.

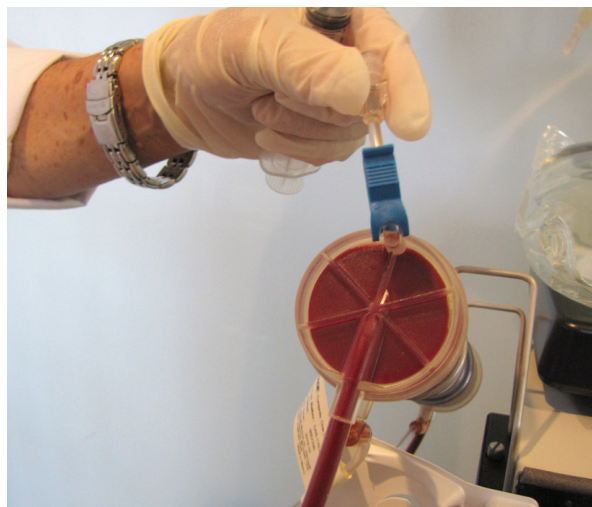
Note: The risk of clotting increases when the blood pump is stopped for a long time.

Alarm 10: Check for Venous Air During TREATMENT

1. Press **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. Press **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 (but not the air) back through the post-dialyzer port.



8. Close the blue clamp on the port securely.
9. Press **TREATMENT**  on the cyclor.
 - › The cyclor displays Yellow Caution 12.
10. Watch the blood as it returns to you, looking for any air in the venous blood line (blue clamp).
 - › The blood pump runs slowly to allow you to observe for air.

If air is seen in the venous blood line:	If no air is seen:
a. Press STOP  on the cyclor. b. Repeat steps 4 through 9 c. If you cannot remove air from the venous blood line, press STOP  and end the treatment. d. Do not rinse back blood if you see air in the venous blood line.	a. Press TREATMENT  to return the blood pump to the programmed rate. b. Open the blue clamp on the post-dialyzer port. 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. Press **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. Press **STOP**  on the cycler.
4. Press **TREATMENT**  on the cycler.
 - › The blood pump runs slowly.
 - › Continue to watch the arterial blood line (red clamp) and the venous header of the dialyzer for air.
5. Attach a 20 mL luer lock syringe to the post-dialyzer port.
6. Press **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. Press **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. Press **TREATMENT**  on the cyclor.

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. Press **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. Press **STOP**  on the cyclor.
4. Press **TREATMENT**  on the cyclor.

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

1. Press **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. Press **STOP**  on the cyclor.
4. Press **TREATMENT**  on the cyclor.

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

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

Check for	Do
Disconnected or poorly connected access pressure pod monitoring line.	Follow steps 3-11 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 cyclor.
 - › The access pressure pod deflates.
4. Press **STOP**  on the cyclor.
 - › 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 cyclor.
10. Press **TREATMENT**  on the cyclor.
11. Confirm that arterial pressures are within range.

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

1. Press **MUTE**  to 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 blue clamp on the venous blood line or the venous access.
Venous access infiltration.	Correct infiltration.

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

Alarm 35: Check Waste Line, Waste Line Pressure High

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

Check for:	Do
The waste or drain lines or SAK dialysate 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 yellow clamp.
Clogged PureFlow SL drain line.	Switch to disposable waste line extension.

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

Note: If unable to resolve an alarm after several attempts, follow the instructions “For balance chamber alarms (Red alarms 35, 37, 38, 39)” on page 12.

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

1. Press **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 cyclor 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. Press TREATMENT  on the cyclor.
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.

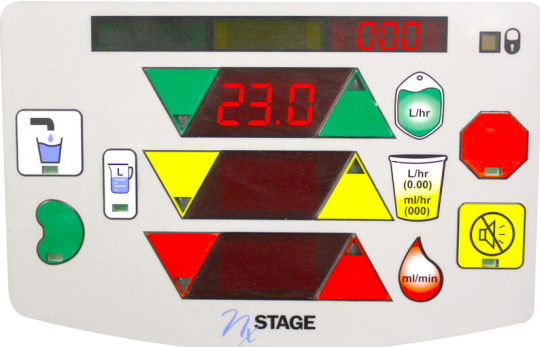
3. Press **STOP**  on the cyclor.
 - › The number **9** appears in the yellow caution window.
 - › **DO NOT PRESS STOP again.**
4. Press **TREATMENT**  on the cyclor.
 - › The treatment automatically resumes when the Yellow Caution 9 disappears.

Note: If unable to resolve an alarm after several attempts, follow the instructions "For balance chamber alarms (Red alarms 35, 37, 38, 39)" on page 12.

Special conditions

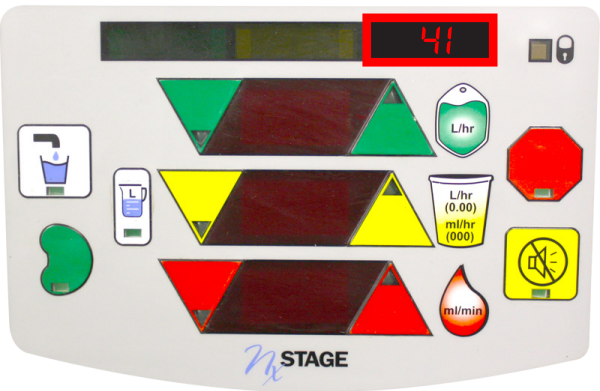
Caution 40: Perform Power Recovery: Power Failure

- 1. Press **MUTE**  to silence the alarm.
- 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. Press 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, press TREATMENT  to resume. In RINSEBACK mode, press ADD FLUID  to resume.

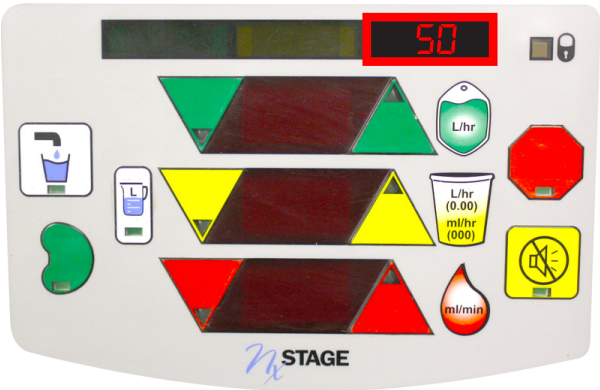
Alarm 41: Failed Power Recovery

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



Alarm 50: Check Fluid Temp, Fluid Temp High

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

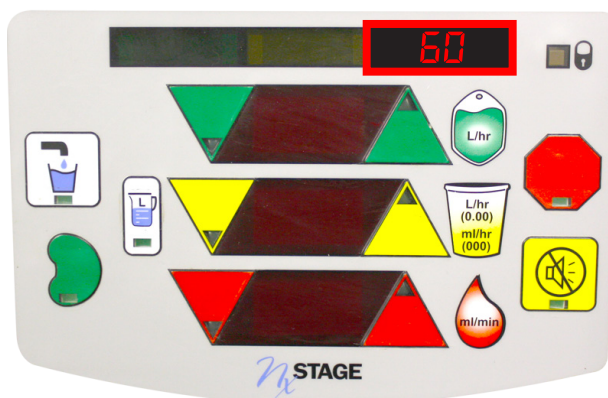


Check for	Do
The warmer or heater setting is too high.	Reduce the heater setting.
Dialysate bags that are too warm prior to set-up.	Cool or replace the dialysate bags.
Treatment environment that is too warm.	Cool the room.

3. Press **STOP**  on the cyclor.
4. Press **TREATMENT**  on the cyclor.

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

1. Press **MUTE**  to silence the alarm.
2. Identify and fix the probable cause(s).
3. Check the color of your waste fluid.
4. Follow your center's instructions for testing waste fluid and determining whether or not you should end your treatment and return your 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.



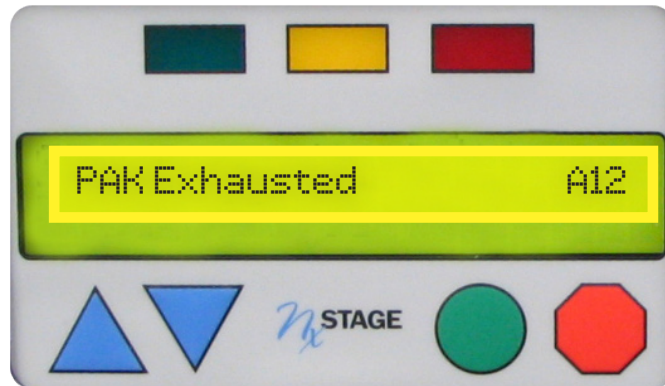
1. Press either the **UP**  or **DOWN**  arrow to display the alarm code.
 - The alarm code displays for ten seconds.
 - The alarm code is determined by which comfort setting lights remain red.
2. Use the *Express Fluid Warmer User Guide* to identify the probable cause(s) and fix it.
3. Press the **UP**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

Standard response for PureFlow SL alarms and cautions

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

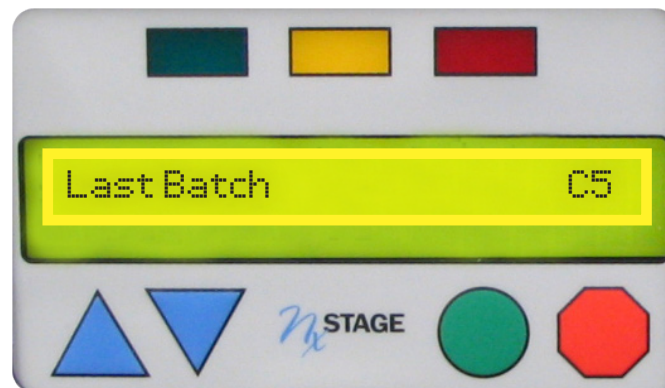
Standard Response to PureFlow SL alarms

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 PureFlow SL User Guide or Complete your Treatment Quick Reference Guide for instructions on priming a new PAK.

Alarm 50: Inlet Pressure Low

1. Press **STOP** .
2. During PAK prime, 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.	1. 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. ▪ The drain line is connected to the back of the CU (disconnect and reconnect the drain line).

2. Press **GO** .
3. If the alarm continues, contact 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 exterior of the PAK including the bottom.
 - › 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. Verify that the correct SAK type has been loaded.
3. Check the lines for closed clamps and kinks; open any closed clamps and correct any kinked lines.

Check for	Do
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.

4. Push on the SAK to mix the fluid.
5. Press **GO**  to retry the test.
6. If the control panel displays "Clamp Line With Blue Check Valve," then close the clamp on the SAK fill line (line with the blue check valve) with a non-serrated clamp.
7. Press **GO** .
 - › The PureFlow SL runs for approximately three minutes.
 - › After about three minutes, the control panel displays "Remove Clamp."
8. Remove the clamp from the SAK fill line.
9. Press **GO**  to retry the test.
10. 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. When making a batch, identify and fix the probable cause(s).

Check for	Do
A line that is kinked, improperly connected, or has a closed clamp.	When making a batch, 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.
Improperly loaded SAK.	▪ The SAK has been loaded properly and is filling evenly.

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

Alarm 833: J1 Connection Loose

3. Press **GO** .

Notes:

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Chapter 2: How do I recognize a problem?

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Introduction: How do I recognize a problem?

Managing medical complications can seem overwhelming, but the chance for complications should be minimized if you:

- Understand and follow the instructions and information in the user guides, your center's policies and procedures, and your prescription.
- Understand what causes medical complications and follow the preventive measures.

IMPORTANT:

Some causes and treatment steps are bold, indicating the need for urgent action. Some complications require immediate attention.

Even if this quick reference guide instructs you to rinse back blood, do NOT rinse back blood in the following situations:

- If your center's policy instructs you not to do so.
- If the blood circuit or patient lines are clotted.
- If the blood is suspected of being hemolyzed.
- If air is seen in the blood circuit or patient lines.

This quick reference guide does not contain an exhaustive list of issues, signs/symptoms, causes, and treatment and prevention information.

Fluid Issues: Cramps

Signs/Symptoms	Possible Cause
Painful muscle tightness, most often occurring in the legs and abdomen.	- Removing too much fluid - Removing fluid too quickly - Other

Treatment	Prevention
- Check your BP and give _____mL of normal saline if the BP is less than _____. - Reduce the ultrafiltration rate on the cyclor to _____L/hr. - Check your BP again and give _____mL of normal saline if the BP is less than _____. - Decrease the ultrafiltration volume on the cyclor to _____L or by _____liters. - Refer to your center's policy if the your BP is less than _____. - Other:	- Always determine your ultrafiltration volume and then rate correctly by subtracting an accurate dry-weight from an accurate pre-dialysis weight. To obtain an accurate pre-dialysis weight ensure that you weigh yourself just before each treatment: - Use a calibrated digital scale (medical grade preferred) that measures in kilograms. - Place the scale on a firm, flat surface, such as bare floor, not on carpet. - Weigh yourself in similar weight clothing each day for both the pre- and post-treatment weights. Dry weight is: - Weight without extra fluid in your tissues (face, hands, abdomen, legs, ankles). - Provided by the medical facility after your physical assessment. - Ensure that the treatment parameters are entered correctly on the cyclor. - Do not exceed your maximum allowable ultrafiltration volume and or ultrafiltration rate. - Other:

Fluid Issues: Hypotension (Low Blood Pressure)

Signs/Symptoms	Possible Cause
▪ Dizziness ▪ Fast or slow heart rate ▪ Paleness ▪ Cold clammy skin ▪ Nausea and/ or vomiting ▪ Cramping ▪ Change in mental status ▪ Other:	1. Blood pressure medications may need to be decreased or stopped. 2. Removing too much fluid or removing fluid too quickly. 3. Eating immediately before or during dialysis. 4. Abnormally fast or slow heart rate. 5. Other:

Treatment	Prevention
In an emergency situation: - Position yourself in the Trendelenburg position. - Give _____mL of normal saline - Perform an emergency rinseback. For causes #2 and #3 - Position yourself in the Trendelenburg position. - Give _____mL of normal saline. - Reduce the ultrafiltration rate on the cyclor to _____L/hr. - Check your BP again and give _____mL of normal saline if the BP is less than _____. - Decrease the ultrafiltration volume on the cyclor to _____L or by _____liters. - End treatment and perform automated rinseback. - Give additional rinseback volume of _____ mL normal saline. - Refer to your center's policy if your BP is less than _____. - Other: For cause #4 - Call emergency personnel (911). - Perform automated rinseback. - Perform emergency rinseback. - Check your heart rate. - Other:	For cause #1 - Take blood pressure prior to each dialysis treatment and contact your physician or dialysis provider if it is below your normal range. Discuss instructions related to blood pressure medication. For cause #2 - Always determine the ultrafiltration volume and rate correctly by subtracting an accurate dry weight from an accurate pre-dialysis weight. See "To obtain an accurate pre-dialysis weight" on page 33 for additional information related to pre-dialysis and dry weight. - Do not exceed your maximum allowable ultrafiltration volume and or ultrafiltration rate. It is recommended to set the fluid removal with a rate of removal limit of less than 10 mL/kg/hr. In general, the recommended rate is less than 8 mL/kg/hr. For cause #3 - Do not have meals just before or during dialysis. For cause #4 - Complete pre-dialysis assessment prior to each dialysis treatment. Do not start treatment if you are experiencing a fast or slow heartbeat. Refer your center's policies or contact your physician. - Other:

Fluid Issues: Hypertension (High Blood Pressure)

Signs/Symptoms	Possible Cause
▪ Headache. ▪ Swelling of ankles, legs, hands, face. ▪ Difficulty breathing. ▪ May have no symptoms, therefore it is important to routinely check your BP. ▪ Other:	1. Excess body fluid from gaining too much weight between treatments. 2. Excess body fluid from not removing enough ultrafiltrate during previous treatments or missing treatments. 3. Prescribed blood pressure medications not taken correctly or prescription may need to be adjusted. 4. Other:

Signs/Symptoms	Possible Cause
For causes #2 and #3 ▪ Check your BP. If it is greater than _____ refer to your center's policy. ▪ Other:	For cause #1 ▪ Follow fluid and diet recommendations. For cause #2 ▪ Always determine the ultrafiltration volume and rate correctly by subtracting an accurate dry weight from an accurate pre-dialysis weight. See "To obtain an accurate pre-dialysis weight" on page 33 for additional information related to pre-dialysis and dry weight. ▪ Ensure that the treatment parameters are entered correctly on the cycler. ▪ Ensure that any fluid consumed or normal saline bolus delivered after obtaining the pre-dialysis weight is added to the ultrafiltration volume. ▪ Follow the treatment schedule. Do not skip treatments. For cause #3 ▪ Complete the pre-dialysis assessment and notify your physician of high blood pressure prior to dialysis. Refer to your center's policies for adjusting blood pressure medication. ▪ Other:

Cardiac Issues: Chest pain/angina

Signs/Symptoms	Possible Cause
▪ Pain or tightness in the chest, arm, back, or jaw. ▪ Pale, cool, clammy skin. ▪ Nausea. ▪ Other:	1. Low blood pressure. 2. Low oxygen level in the heart. 3. Other:

Treatment	Prevention
For causes #1 and #2 ▪ Refer to your center’s policies. ▪ Perform automated rinseback, or ▪ Perform emergency rinseback. ▪ Other:	For cause #1 ▪ Always determine the ultrafiltration volume and rate correctly by subtracting an accurate dry weight from an accurate pre-dialysis weight. See “To obtain an accurate pre-dialysis weight” on page 33 for additional information related to pre-dialysis and dry weight. ▪ Refer to your center’s policies regarding patient complaint of chest pain/angina to ensure blood pressure medication is assessed prior to treatment. ▪ Take blood pressure prior to each dialysis treatment and refer to your center’s policies if your BP is below the normal range. For cause #2 ▪ Refer to your center’s policies regarding patient complaint of chest pain/angina for further assessment and instructions prior to treatment. ▪ Other:

Cardiac Issues: Arrhythmia (Irregular Heart Beat)

Signs/Symptoms	Possible Cause
▪ Abnormal or irregular pulse (skipped or extra beats). ▪ Abnormally slow (less than ____) or abnormally fast (greater than ____) heart rate. ▪ Feelings in the chest of pounding, bounding, or strong heartbeat. ▪ Other:	1. Electrolyte (potassium) imbalance. 2. Known underlying heart disease. 3. Unknown heart disease. 4. Poor blood circulation resulting in low oxygen level in the heart. 5. Low or high fluid volume causing low or high blood pressure. 6. Other:

Treatment	Prevention
For causes #1, #2, #3, and #4 ▪ Refer to your center’s policies. ▪ Perform automated rinseback; or ▪ Perform emergency rinseback. For cause #5 ▪ Check your blood pressure and refer to either: › For hypotension (low), see “Fluid Issues: Hypotension (Low Blood Pressure)” on page 34. › For hypertension (high), see “Fluid Issues: Hypertension (High Blood Pressure)” on page 36. ▪ Other:	For all causes ▪ Refer to your center’s policies. ▪ Other:

Signs/Symptoms	Possible Cause
- Feeling hot. - Fever (Temperature higher than ____) - Chills. - The vascular access site is red, warm to touch, swollen, or draining. - Other:	- Infection (local or whole body). - Other:

Treatment	Prevention
For cause #1 ▪ Check body temperature. ▪ Refer to your center’s policies. ▪ Other:	For cause #1 ▪ Always use aseptic technique. Refer to the <i>How Do I Maintain Aseptic Technique?</i> quick reference guide for additional information. ▪ Never cannulate an access that is suspected of potential infection. ▪ Always contact your physician before cannulating. ▪ Refer to your center’s policies. ▪ Other:

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Blood Issues: Circuit Clotting

Signs/Symptoms	Possible Cause
- Changes in blood circuit pressures during treatment. Lower venous and effluent pressures indicate that clotting may be occurring within the dialyzer. - Alarms and cautions 20, 21, 22, 24, 30, 32, 33, and 34 may signal poor blood flow, dialyzer clotting, and clotting blood lines. - Dark-looking blood within your blood lines and at the venous header of the dialyzer. - Blood stops pulsating within the access pressure pod. - Other:	- Repeated stopping of blood flow due to multiple alarms. - Prolonged alarm recovery. You are repeatedly pressing MUTE  - STOP  -TREATMENT  without resolving the cause of the alarm. - Not enough heparin or other anticoagulant medication. - Air in the blood circuit. - Other:

Treatment	Prevention
For all causes ▪ If the dialyzer or blood lines are clotted, end the treatment. Do NOT rinse back the blood. For cause #3 ▪ Refer to your center's policies regarding anticoagulant medication. For cause #4 ▪ Remove air from the blood circuit promptly, following the instructions in the cyclor user guide. ▪ Ensure that the arterial and venous blood line connections are secure. ▪ Other:	For all causes ▪ The risk of blood clotting increases when the blood pump is stopped, such as during alarms. If you can not resolve the issue within 2-3 attempts, rinse back the blood unless the blood circuit is clotted, the blood is hemolyzed, air is seen in the blood circuit or in blood lines. Contact your physician or dialysis provider. ▪ Routinely monitor circuit pressures and periodically flush the dialyzer to identify early stages of clotting and plan interventions. ▪ Refer to your center's policy regarding clotting or blood loss for further instructions prior to treatment. For causes #1 and #2 ▪ Ensure blood flow is unrestricted. Clotting in the dialyzer and/or blood lines begins as soon as the blood pump is off. ▪ Respond to all alarms promptly and correctly per the user guide instructions. ▪ Contact NxStage Technical Support for additional troubleshooting alarm assistance. For cause #3 ▪ Refer to your center's policy for anticoagulant assessment prior to treatment. ▪ Follow your anticoagulant prescription. For cause #4 ▪ Promptly remove all air from blood lines and dialyzer promptly following the instructions in the cyclor user guide for Alarm # 10 and # 11. ▪ Prime the cartridge following the instructions in the cyclor user guide before starting treatment. ▪ Ensure that the arterial and venous blood line connections are secure before starting treatment.

Signs/Symptoms	Possible Cause
▪ Blood on your clothes, chair, and/or floor. ▪ Low blood pressure. ▪ Fast heart rate. ▪ Dizziness/ fainting. ▪ Seizure. ▪ Heart stopping. ▪ Other:	1. Blood lines and vascular access lines or connections came apart. 2. The catheter port cap is not connected and/or the catheter clamp is not closed. 3. The vascular access was not taped properly and fell out. 4. The fistula needle came out of the access. 5. The vascular access sites were not visible during treatment. 6. Other:

Treatment	Prevention
For all causes ▪ End the treatment. Do NOT rinse back the blood. ▪ Call emergency personnel (911) for significant blood loss signs (low blood pressure, dizziness, fainting, seizure, heart stopping). ▪ Refer to your center's policy. ▪ Other:	For all causes ▪ Respond to all system pressure alarms and cautions. Repeatedly pressing MUTE  - STOP  - TREATMENT  without resolving the cause of the alarm can result in more significant blood loss. ▪ Do not allow pets in treatment area during treatment. ▪ Minimize distractions caused by the presence of untrained personnel such as children and other family members. ▪ Routinely monitor for blood leaks; the cyclor may not sense all leaks. For cause #1 ▪ Ensure that blood lines and the vascular access lines and connections are visible at all times during treatment and rinseback. Ensure that all manual connections, especially the rotating luer locks connecting the blood lines to the vascular access lines, are secure and fluid tight. ▪ Test that the fluid detection sensor, if used, is functioning and is correctly installed in the base during treatment. Respond to fluid detection sensor alarms. ▪ Monitor for blood leaks. For cause #2 ▪ Keep the catheter port capped and clamped when not in use. For cause #3 ▪ Ensure that the vascular access is taped securely. ▪ Ensure the access sites and connections are visible during treatment. DO NOT cover with sheets, blankets or clothing. ▪ Other:

Blood Issues: Hemolysis

Signs/Symptoms	Possible Cause
▪ Chest, back, or abdominal pain. ▪ Shortness of breath. ▪ Low blood pressure. ▪ Cherry-red colored blood. ▪ Burning in the venous access site. ▪ Pink-tinged waste or effluent without the occurrence of a cyclor Alarm 60: Blood Detected in Waste Line. ▪ Other:	1. Blood forced through an obstructed, narrowed, clotted, or severely kinked blood line, catheter or needle. 2. High arterial pressure outside your normal range. 3. Constant starting and stopping of blood pump due to multiple alarms. 4. Underlying medical condition or medication, such as heart valve replacement, recent blood transfusion reaction. 5. Source water and/or dialysate are inadvertently contaminated (for example: bleach, chloramines). 6. Other:

Treatment	Prevention
For all causes ▪ End the treatment. Do NOT rinse back the blood. ▪ Call emergency personnel (911) . ▪ Refer to your center's policy. ▪ Other:	For cause #1 ▪ Inspect each cartridge before use for any kinks. Do not use any blood tubing that is dented or flattened by more than one third of its diameter. ▪ Follow the prescription for access needle size and blood flow. ▪ Monitor for signs of hemolysis during treatment. Do not kink lines when placing the dialyzer in the filter holder. For cause #2 ▪ Monitor the arterial pressure and watch for any values outside of normal ranges. Cyclor Alarm or Caution 24: Access Pressure Decreasing to Low Limit will occur if the arterial pressure goes to -220 mmHg. ▪ The cyclor displays the arterial access pressure without the negative sign. Therefore, when the arterial pressure becomes lower (more negative), the arterial pressure displayed on the cyclor becomes a higher number, indicating a more restricted flow. For cause #3 ▪ Respond to all alarms promptly and correctly per the user guide instructions. ▪ Contact NxStage Technical Support for additional troubleshooting alarm assistance. For cause #4 ▪ Ensure that your physician or dialysis provider is always aware of your current medical condition and medications. For cause #5 ▪ Ensure source water testing meets PureFlow SL source water requirements prior to making a batch of dialysate. ▪ Respond to all PureFlow SL Alarms and Cautions per the user guide. ▪ Ensure chloramines test less than or equal to 0.1 ppm (parts per million) prior to dialysate use. ▪ Ensure bleach (used to clean equipment) does not enter the dialysate.

Blood Issues: Air Embolism

Signs/Symptoms	Possible Cause
▪ Chest pain. ▪ Trouble breathing. ▪ Coughing. ▪ Blue lips, fingers, toes. ▪ Visual disturbances. ▪ Confusion. ▪ Loss of consciousness. ▪ Other:	1. Air not removed from the blood circuit is entering blood stream. 2. Air is entering the catheter and blood stream if the catheter is left uncapped or unclamped or if the blood line becomes disconnected while the blood pump is still running. 3. Other:

Treatment	Prevention
For all causes ▪ End the treatment. Do NOT rinse back the blood. ▪ Call emergency personnel (911) . ▪ If possible, lie flat on your left side with your head down. ▪ Contact your physician or dialysis provider for further instructions. ▪ Other:	For all causes ▪ During set up, ensure you insert the cartridge correctly within the cyclor. Manually press the lines into all three air detectors. ▪ Ensure all air is removed from the arterial and venous blood lines during “snap and tap”. ▪ Contact NxStage Technical Support for additional troubleshooting alarm assistance. ▪ Before performing rinseback, visually inspect the lines for air. Do not rinseback if air is present or if you are not able to recover from an air alarm. For cause #1 ▪ Respond to all alarms promptly and correctly per the user guide instructions. For cause #2 ▪ Tighten the cap and close the clamps on the catheter when not in use. ▪ Ensure the access and blood line connections are visible during treatment. ▪ Other:

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