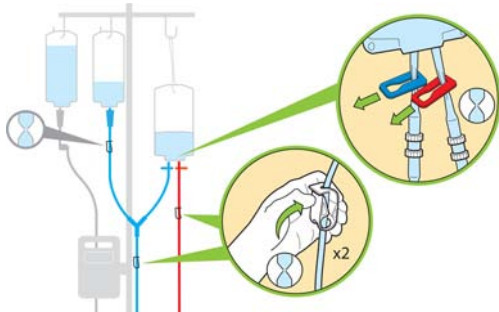


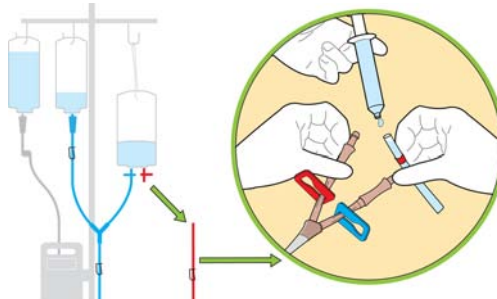
### Starting Therapy

Prior to therapy, connect tubing to Catheter and start blood pump following these steps:

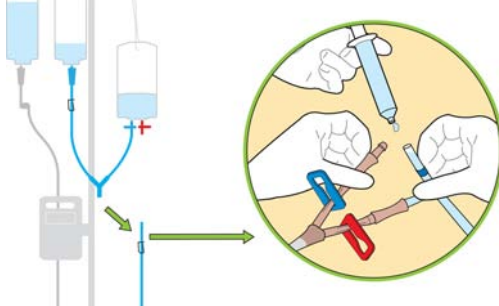
1 Close All Clamps



2 Connect TO PATIENT (Red) Tubing Set to Catheter



3 Connect FROM PATIENT (Blue) Tubing Set to Catheter



4 Press the Start Therapy Function Key to enter Therapy Mode



Ensure the following:

- No Air in the Circuit
- Seal Flush Flow Rate of 30 mL/hr
- All Clamps are Open

5 Press and hold the Pump Start/Stop key to initiate therapy

### Managing Therapy

Address the following areas during Initial Therapy:

#### Controlling Sweep Gas Flow

Adjust sweep gas flow with upper set of Arrow Keys. It can be set to 0 L/min, or between 1.0 and 10.0 L/min in increments of 0.1 L/min.



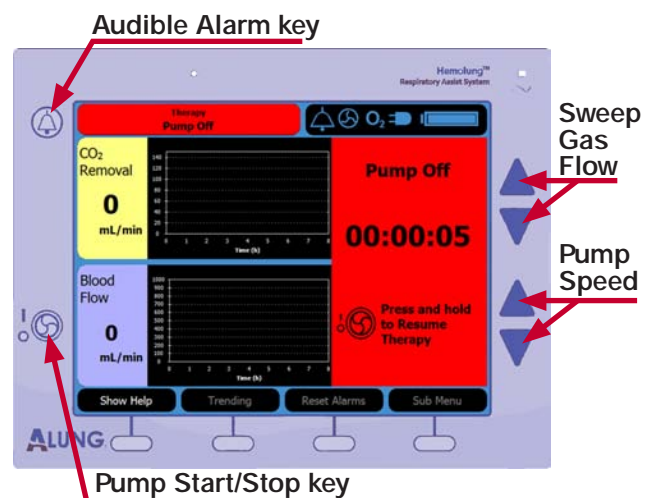
**CAUTION:** Set Sweep Gas to lowest setting that provides adequate carbon dioxide removal. High Sweep Gas setting can cause patient heat loss. Monitor patient temp during Hemolung therapy.

#### Controlling Pump Speed

Adjust pump speed with lower set of Arrow Keys. It can be set between 500 and 1400 RPM in increments of 10 RPM.



Higher pump speeds will not always generate higher blood flow. Catheter can lodge against vessel wall due to negative pressure. Set pump speed to lowest setting that provides desired blood flow.



Monitor during initial therapy:

- Hemolung RAS CO<sub>2</sub> Removal
- Ventilator Status
- Arterial Blood Gasses

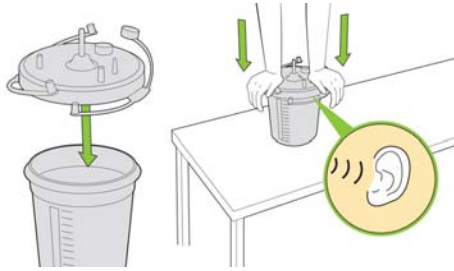
**Providing Supplemental O<sub>2</sub>** - If recommended by the physician, the Hemolung RAS can provide supplemental oxygenation to the patient through the use of oxygen as the sweep gas. See Change Sweep Gas for details.

**Operation During Purge** - During Therapy, the Controller automatically enters a purge cycle every 15 minutes. This removes moisture from the fiber membrane and temporarily makes the pump louder. During the cycle "CO<sub>2</sub> Removal" is temporarily displayed on screen as "---" and cannot be adjusted.

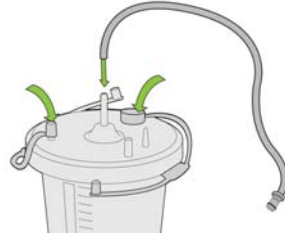
**Routine Tasks**

**Daily Vacuum Canister Replacement** - To replace follow these steps:

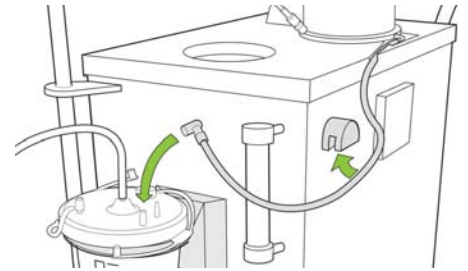
1 Assemble New Vacuum Canister



2 Close Unused Ports and Attach Vacuum Tubing



3 Attach Sweep Gas Elbow



**Routinely inspect the entire circuit** - Including the Hemolung Cartridge, Catheter, and blood tubing, for signs of failure such as:

- Blood leaking from the circuit
- Blood leaking into the sweep gas
- Damage to the sweep gas circuit
- Bubbles in the blood
- Excessive vibration
- Thrombus formation

If any above conditions are found, replace at the discretion of the physician.

**Change Sweep Gas** - To change the sweep gas while in Therapy mode follow these steps:

- 1 Press the Sub Menu Function Key followed by the Settings Function Key.
- 2 Use either set of Arrow Keys to select the desired sweep gas.
- 3 Connect or disconnect oxygen to the Hemolung RAS, depending on the sweep gas selected.
- 4 Press the Main Menu Function Key to return to the main Therapy screen.

**Change Seal Flush Fluid** - Replenish seal flush fluid according to hospital procedures using normal saline.

Refer to the Setup and Priming reference guide for instructions on setting up the seal flush.

**Catheter Maintenance** and insertion site care is recommended per your institutional protocol.

Acceptable cleaning solutions and disinfectants include:

- Aqueous based povidone iodine (Betadine®)
- Aqueous chlorhexidine topical solutions (ChlorPrep®)
- Chlorhexidine patches (Biopatch®)
- Chlorhexidine Gluconate (Hibiclens®)
- Bacitracin and Neosporin® Ointments



**CAUTION:** Do not use acetone or alcohol on any part of the Catheter tubing. These liquids may damage the Catheter.

**Alarms**

**Alarm Levels** - Highest priority alarms are always indicated by audible and visual indicators and have precedence over any other alarm type. During multiple alarms, only the highest priority ones appear in the notification area. Active alarms can be viewed by pressing the Show Help Function Key.

**High Priority** - In some cases the pump stops to prevent harm to the patient.

**Medium Priority** - Pump continues to run but a prompt response is required to prevent diminished performance.

**Low Priority** - Pump continues to run but system is operating in an unexpected state.

**Critical Errors** - Condition that renders equipment unusable. After correcting error, power cycle system to clear.



**WARNING:** If pump is stopped during therapy, Do Not restart and continue therapy without a COMPLETE evaluation of the patient and Hemolung RAS. First Check:

- Patient's condition and anticoagulation status
- Length of time pump has been stopped
- Any signs of thrombus formation in system
- Consider any institutional procedures for continuing therapy

Failure to properly evaluate patient and system conditions before reinitiating therapy may result in thromboembolism.

**Alarm Indicators** - Descriptions are shown on screen, along with an audible tone and indicator light when an alarm is present. The following chart shows alarm types and user notifications:

Alarm Priority	Visual Indication	Audible Indication	On-Screen
High (Pump Stops)	Red LED Flashes	10 Repeating Beeps	Red Notification
High (Pump Runs)	Red LED Flashes	10 Repeating Beeps	Red Notification
Medium (Pump Runs)	Yellow LED Flashes	3 Repeating Beeps	Yellow Notification
Low (Pump Runs)	Yellow LED Solid On	None	Yellow Notification
Critical Error (Pump Stops)	Red LED Flashes	10 Repeating Beeps	Message with Special Instructions

**Silencing Audible Alarms** - To pause or silence the audible notification from an alarm, press the Audible Alarm Key on the upper left side of the display. Pressing the key once will silence the audible alarm for 2 minutes. Pressing and holding the key will silence the alarm indefinitely.