Alaris™ VP Plus Guardrails™ Volumetric Pump

Model: 9003TIG03-G

Quick Reference Guide – en

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This guide is not intended to be comprehensive instructions for the set-up and operation of the Alaris™ VP Plus Guardrails™ Volumetric Pump (the "Pump"): the Directions For Use, as updated from time to time by the Manufacturer (the "DFUs"), are the sole reference for Pump information. This guide is intended only for qualified healthcare professionals having received appropriate training to operate the Pump (the "HCPs"). HCPs must have consulted the DFUs prior to operating the Pump.

Controls:

Symbol	Description
	**ON/OFF** button - Press once to switch the Pump on. Press and hold down for approximately three seconds to switch the Pump off.
	**RUN** button - Press to start the infusion. The green LED will flash during infusion.
	**HOLD** button - Press to put the infusion on hold. The amber LED will be lit while on hold.
	**MUTE** button - Press to silence active alarm, warning or prompt for approximately 2 minutes. To silence the active audio for an extended interval of 15 minutes; press **CANCEL**, then press and hold the **MUTE** button until 3 rapid beeps are heard.
	**PRIME/BOLUS** button - Press to access **PRIME** or **BOLUS** softkey. Press and hold down softkey to operate.
	**OPTION** button - Press to access optional features.
	**PRESSURE** button - Use this button to display the line pressure, trend display, and adjust the downstream occlusion alarm limit.
	**CHEVRON** keys - Double or single for faster / slower increase / decrease of values shown on display.
	**BLANK SOFTKEYS** - Use in conjunction with the prompts shown on the display.

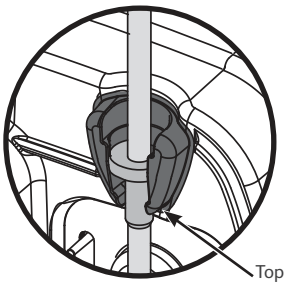
Indicators:

Symbol	Description
	**AC POWER** indicator - When illuminated the Pump is connected to an AC power supply and the battery is being charged.
	**BATTERY** indicator - When illuminated the Pump is running on the internal battery. When flashing, the remaining battery run time is limited.

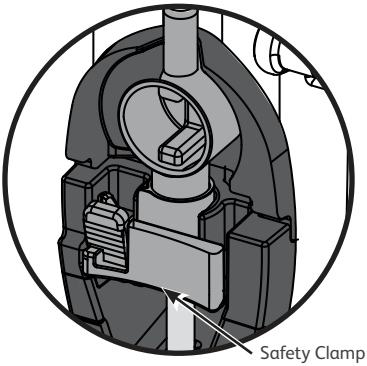
- Ensure the appropriate infusion set has been selected.
  Only use dedicated Alaris VP Plus Guardrails Volumetric Pump infusion sets.
- Follow the instructions supplied with the infusion set.
- Ensure that the tubing is inserted completely into the top set retainer through to the tubing guide avoiding any slack.
- Infusion accuracy is dependant upon correct placement of top adaptor of the infusion set into the top set retainer of the Pump. Failure to properly place the adaptor in the retainer may lead to over or under infusions.
- If the door is difficult to close, open the door fully to verify correct loading of the infusion set.

1. Close roller clamp.
2. Insert the bag spike into the fluid container and hang appropriately at a minimum height of 300mm above the Pump.
3. Fill the drip chamber approximately half full.
4. Open roller clamp and prime set slowly, inverting the pumping segment. Massage the pressure disc in the direction of the fluid flow to ensure air removal. Continue to prime the infusion set until the fluid drops form at the end of the infusion set, ensuring all air is removed.
5. Close roller clamp.
6. Open door and load infusion set as follows:

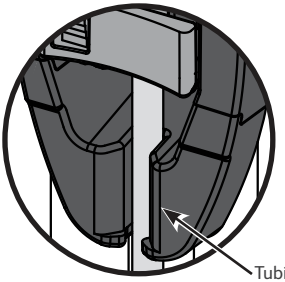
   i) Fit top adaptor of infusion set into top set retainer.



ii) Insert Safety Clamp and pressure disc into retainer.



iii) Ensure infusion set is fully inserted into tubing guide and all air is removed from the infusion set.



iv) Use minimal stretching of the silicone segment when loading or priming the infusion set.

7. Close door and open roller clamp. Ensure no drops are falling in the drip chamber. If drops are falling in the drip chamber then clamp the infusion set immediately, open door and verify correct loading of the infusion set.

Pushing the Safety Clamp Slider completely into Safety Clamp Frame may lead to uncontrolled flow to the patient. Therefore, always close the roller clamp before pushing in the Safety Clamp Slider, if required.

Prime and load the infusion set, follow the 'Loading an Infusion Set' instructions first.

1. Switch the Pump on .
2. When **CLEAR SETUP?** screen is shown:
   - Select **YES** to clear previous setup
   - Select **NO** to retain previous setup goto step 6

3. When **PROFILE** screen is shown:
   - Select **NO** to change profile and then follow on screen prompts
   - Select **YES** retains current profile

   Note: The **PROFILE** screen is only shown if more than one profile is enabled in the data set.

4. When Select Infusion Setup screen is shown select using the keys:
   - **ml/h**
   - **DOSING ONLY**
   - **DRUGS (A-Z)**
5. Press **OK** to confirm and follow the prompts as required.

6. Clear Volume Infused, if required, by selecting **VOLUME** softkey and then press **CLEAR** softkey.

7. Enter Volume To Be Infused (VTBI), if required, by selecting **VTBI** softkey on main display.
   - Set VTBI using the **BAGS** option and/or the keys. Press **OK** to confirm.
   - Set the **END RATE** using the keys. Press **OK** to confirm.

8. Enter or adjust the rate using the keys, if required.
9. Connect the fully primed infusion set to the patient's vascular access device.
10. Press key to start the infusion. **INFUSING** will be displayed.

To stop the infusion immediately perform one of the following actions:

- press the key, recommended action
- close the roller clamp and then open the door

Hands-On Bolus Only

1. During infusion press the button once to display the **BOLUS MODE** screen.
2. Use the keys to adjust the bolus rate if required.
3. To deliver the bolus press and hold the flashing **BOLUS** softkey. When the desired bolus volume has been delivered or the bolus volume max is reached, release the softkey.

If the VTBI is reached during a bolus, a VTBI complete alarm or warning will sound.

Hands-On and Hands-Free Bolus

1. During infusion press the button once to display the **BOLUS MODE** screen.
2. Press the **YES** softkey to go to the **HANDSFREE** bolus screen or press **HANDSON** softkey to go to the HANDSON only bolus.
3. Use the keys to adjust the bolus **DOSE** if required. If necessary press the **RATE** softkey to adjust the bolus delivery rate.
4. Press the flashing **BOLUS** softkey once to begin the delivery of the preset bolus.
5. To terminate a bolus being delivered press **STOP** softkey. This will stop the bolus and continue infusing at the set rate. Press the button to stop the bolus delivery and place the Pump on hold.

NOTE: If the bolus volume reaches the set bolus volume max the bolus will stop and the Pump will revert to infuse at the set infusion rate.

In-Line Pressure Monitoring

The infusion set pressure sensing disc enables the measurement of in-line pressure and in conjunction with trending graphs, can support early clinical assessment and intervention which may assist in reducing the risk of IV complications.

The downstream occlusion alarm limit set through the Auto pressure or manual functions can assist in optimizing the time to alarm.

Despite the benefits provided by early detection of occlusions and reduced time to alarm, the Pump is not designed to provide protection or detection of extravasation nor infiltration, therefore, the clinician, while monitoring the pressure trend graphs, must also check the infusion site on a regular basis and follow hospital protocols when IV complications occurs.

Pressure Occlusion Alarm Options

To check and adjust the downstream occlusion alarm limit press the ☰ button. The display will change to show a 20 minute pressure trend graph displaying the current in-line pressure and the downstream occlusion alarm limit.
The downstream occlusion alarm limit can either be adjusted manually or automatically.

Manual The downstream occlusion alarm limit can be set manually by pressing the ⏫⏫⏬⏬ keys to increase or decrease the pressure alarm limits followed by the **OK** softkey. The new limit will be indicated numerically on the display screen.

Auto Pressure The Auto Pressure feature may be used when a stable pressure has been achieved over a short period of infusion. If Auto Pressure has been enabled, in the editor, the Auto Offset value (XX)mmHg set in the profile, will be used to calculate a new downstream occlusion alarm limit by pressing the **AUTO** softkey followed by the OK softkey.

Auto Set Pressure If the Auto Set Pressure option is enabled, in the editor, the Pump automatically adjusts the downstream occlusion alarm limit. This occurs once 15 minutes after the start of the infusion. The Pump automatically adjusts the downstream occlusion alarm limit to the Auto Set Value (XX) mmHg above the average infusion pressure, taken from the average of the last 5 minutes of the infusion.

Note: XX is the **AUTO OFFSET** pressure and is determined by the user. This adjustment, **AUTO OFFSET** value 15-100mmHg, is configurable by profile within the data set. At pressures up to 100mmHg the **AUTO OFFSET** value is added. For pressures above 100mmHg the downstream occlusion alarm limit is set to whatever the **AUTO OFFSET** value is as a percentage above the average infusion line pressure up to the maximum occlusion alarm limit defined within the profile.

Pressure Trend

1. To check the pressure trend graph press the ☰ button.
2. Press the **TREND** softkey to view the pressure trend of the previous 12.5 hours of clock time. The pressure trend can be viewed at 15 minute intervals by using the **+/-** softkeys. The pressure trend is updated every 15 minutes and can be viewed with greater resolution. The pressure trend graph displays the line pressure at a given time.
3. Press the **OK** softkey to exit the pressure screen.

Display	Action
AIR IN LINE Single air bubble exceeds alarm limit. Set not fitted correctly into air in line detector.	• Ensure set is fitted correctly in the air-in-line detector. • Inspect infusion set for air bubbles and take appropriate action. • Remove air according to hospital policy. • Check fluid level in container. • Check fluid level in drip chamber. • Restart infusion.
AIR IN LINE Accumulated air bubbles exceeds alarm limit.	• Inspect infusion set for air bubbles and take appropriate action. • Remove air according to hospital policy. • Check fluid level in container. • Check fluid level in drip chamber. • Restart infusion.
DOOR OPEN Door was opened during an infusion.	• Close door or clamp infusion set using roller clamp. • Restart infusion.
DOWNSTREAM OCCLUSION A blockage has occurred downstream.	• Check fluid path between Pump and patient for clamps, connectors, kinks or blockages. • Examine access site for signs of complications e.g. redness, swelling, pain, heat.
NO FLOW Flow sensor detects no flow.	• Check flow sensor. • Check fluid level in container. • Ensure all clamps above Pump are open. • Check fluid level in drip chamber. • Ensure that the bag spike is inserted correctly. • Check flow sensor is clean.
DO NOT USE Internal error.	• Remove Pump from use.

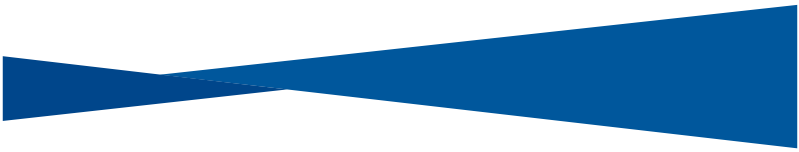
Display	Action
UPSTREAM OCCLUSION A blockage has occurred upstream. Possible container empty.	• Check that the fluid container is at a minimum height of 300mm above the pump. • Ensure the bag spike is fully inserted into the fluid container and not obstructed. • Ensure the fluid container is not empty. • Ensure air vent on drip chamber is open on all glass and semi rigid containers. • Check there are no kinks in the infusion sets above the Pump. • Check all infusion set clamps above the Pump are fully open. • Check fluid level in the drip chamber. • Open the Pump door and ensure the infusion set is loaded correctly. • Consider if the 15µm filter in the drip chamber is blocked or partially blocked. • Ensure the infusion set has not been used for more than 72 hours. • If alarm continues consider changing the infusion set.
FLOW ERROR Gross difference between detected drops and expected amount of drops.	• Clamp infusion set using roller clamp. • Check flow sensor. • Check fluid level in drip chamber.
FLOW ERROR (In Secondary infusion mode only) Unexpected drops detected.	• Hang secondary container above primary. • Check drops are from secondary container when infusing. • Flow sensor disconnection is recommended.
FREE FLOW Uncontrolled flow possible.	• Clamp infusion set using roller clamp. • Remove Pump from use.

Display	Action
BATTERY EMPTY The internal battery is exhausted. The Pump will automatically switch off in the immediate future.	• Switch Pump off and connect to power supply immediately.
SAFETY CLAMP Safety clamp broken or missing.	• Clamp infusion set using roller clamp. • Replace infusion set. • Investigate and correct set loading.
SET MISLOAD Set loaded incorrectly.	• Clamp infusion set using roller clamp. • Investigate and correct set loading.
FLOW SENSOR DISCONNECT Flow sensor unplugged during infusion.	• Check / replace flow sensor or set VTBI.
WRONG SET Safety clamp not detected	• Clamp infusion set using roller clamp. • Check set and close door. • Replace infusion set as required.
DOOR CLOSE INCOMPLETE Safety clamp in non-occluded position with door open or obstructed.	• Clamp infusion set using roller clamp. • Investigate and correct set loading. • Close door.
LEVER OPEN Door lever is open	• Check door lever. • Check lever hooks. • Check lever is not obstructed, if so, free obstruction.
VTBI DONE Intended VTBI completed. When **STOP** selected as the **END RATE**.	• Set new VTBI or clear VTBI.
ATTENTION Pump left on hold for 2 minutes after first **ATTENTION** warning.	• Review Pump setup. Start infusion or turn off Pump.

Display	Action
BATTERY LOW Low battery threshold sensed; remaining battery run time is limited; if cancelled will reoccur every ten minutes if not plugged in.	• Connect to power supply. • Check power cable.
AC POWER FAIL AC power disconnected or failed.	• Reconnect to power supply.
VTBI DONE Intended VTBI completed. When **KVO** or **CONTINUE** are selected as the **END RATE**.	• Set new VTBI or clear VTBI.
AIR-IN-LINE Air detected in infusion set at the start of infusion. Set not fitted correctly into air in line detector.	• Ensure set is fitted correctly in the air in line detector. • Assess air in infusion set. • Check fluid level in drip chamber. • Check fluid level in container.
SET CLOCK Date/time not set.	• Qualified service personnel must set date/time. • Press **CANCEL** softkey to continue.
TITRATION Rate titration not confirmed.	• Confirm or cancel new rate.
RATE LOCK Rate lock not confirmed.	• Select **YES** or **NO** as required.
LOG FAILURE Unable to update event log.	• Qualified service personnel may need to service the Pump.
SET SERIAL NUMBER Serial number not set.	• Contact qualified service personnel to set the serial number.
NEAR END OF INFUSION The Pump is nearing the end of the infusion. This value can be configured.	• Prepare next infusion, if required.
KVO Occurs after a **VTBI DONE** warning is cancelled if **KVO** was selected as the **END RATE** setting.	• Set new infusion or stop treatment

Display	Action
ATTENTION Pump left on hold for 2 minutes without starting operation.	• Review Pump setup. • Start infusion or turn off Pump.
SET VTBI No flow sensor / VTBI.	• Set VTBI or fit flow sensor.
SET NOT FITTED No infusion set fitted.	• Fit infusion set.
LOCKED Rate change attempted whilst locked.	• Unlock rate to adjust infusion settings.
ADD DRUG Drug selection required.	• Press ? to access options menu. • Select **DRUGS A-Z** using the ▲▲ ▼▼ keys. • Press **OK** to confirm.

Display	Action
DOSE WOULD EXCEED Infusion rate entered exceeds a Guardrails soft limit.	• Check the infusion setting. • To confirm **OVERRIDE LIMIT?** press **YES**. • To deny **OVERRIDE LIMIT?** press **NO**.
DOSE UNDER Infusion rate entered is under a Guardrails soft limit.	
DOSE NOT PERMITTED Dose rate entered exceeds the hard maximum limit.	• Check the infusion setting and adjust to appropriate required value.
RATE NOT PERMITTED Infusion rate entered exceeds the hard maximum limit.	
CONCENTRATION NOT PERMITTED Concentration entered exceeds the hard maximum limit, or is under the hard minimum limit.	
BOLUS DOSE NOT PERMITTED Bolus dose rate entered exceeds the hard maximum limit.	
WEIGHT ABOVE LIMIT Patient weight entered exceeds a Guardrails soft limit.	• Check the weight setting. • To confirm **OVERRIDE LIMIT?** press **YES**. • To deny **OVERRIDE LIMIT?** press **NO**.
WEIGHT BELOW LIMIT Patient weight entered is under a Guardrails soft limit.	
BOLUS DOSE WOULD EXCEED Bolus dose rate entered exceeds a Guardrails Soft Limit.	• Check the bolus setting. • To confirm **OVERRIDE LIMIT?** press **YES**. • To deny **OVERRIDE LIMIT?** press **NO**.
BOLUS DOSE UNDER Bolus dose rate entered is under a Guardrails soft limit.	



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