

Trilogy 100 Ventilator

Information and User Guide for Qualified Health Professionals

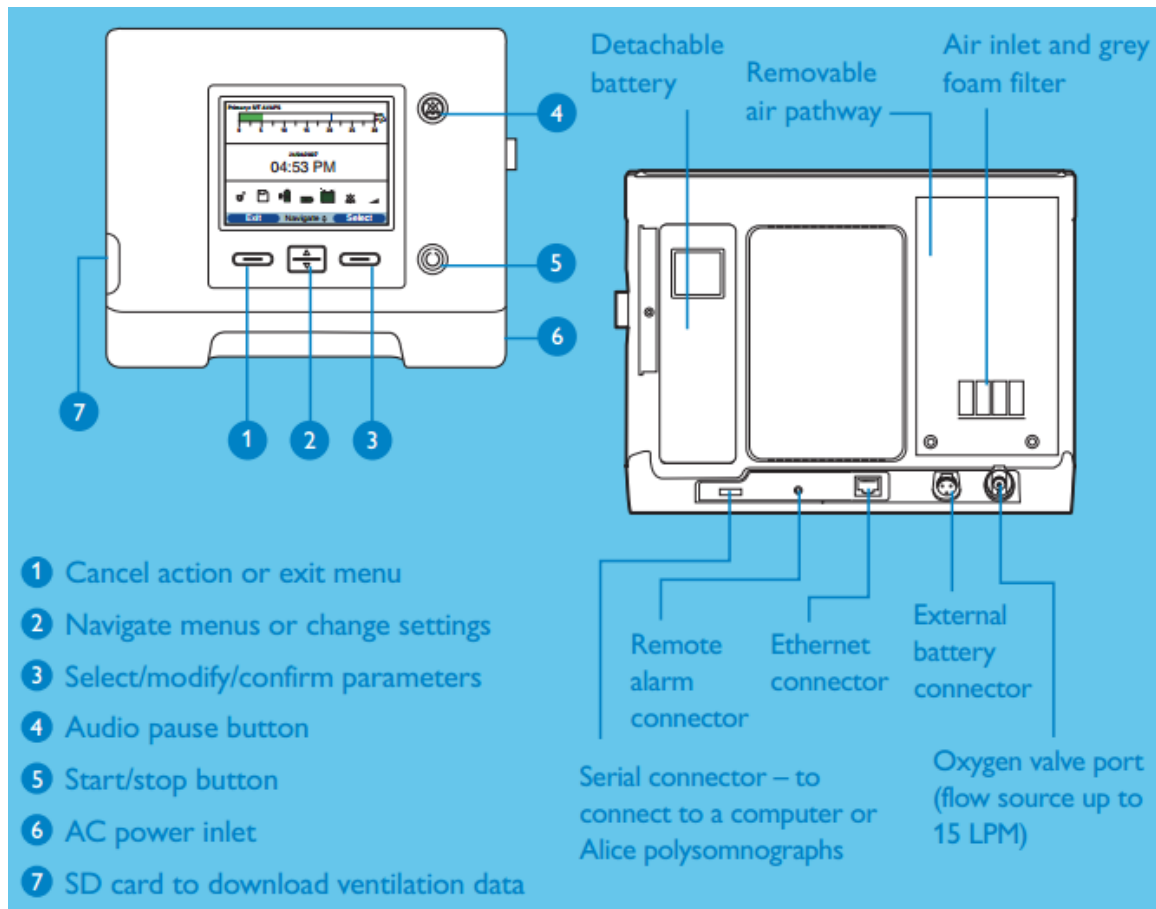


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Please Note: This user guide includes detailed guidance on setting and altering ventilation parameters. This guide should therefore be used only by qualified medical professionals. For non-qualified members of staff please use the alternative user guide titled '*Trilogy 100 Ventilator Information and User Guide for Home Care Workers*'. The document will be reviewed on an annual basis and the reader should take note of the review dates on the document. The information contained was true at the time of review. This document was also reviewed by Respironics for accuracy.

Description of the Outside of the Ventilator



Routine maintenance

Under normal usage the grey foam filter should be cleaned once a week and replaced with a new filter every three to six months.

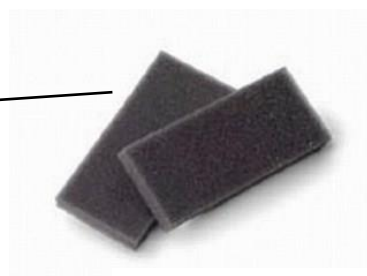
To replace filter:

1. Ensure device is off and disconnect the device from the power source.
2. Remove the filter from the enclosure by gently squeezing the filter in the center and pulling it away from the device.
3. Examine the filter for cleanliness and integrity.
4. Wash the grey foam filter in warm water with a mild detergent. Rinse thoroughly to remove all detergent residue. Allow the filter to air dry completely before reinstalling it. If the foam filter is torn or damaged, replace it. (Only Respirationics-supplied filters should be used as replacement filters.)
5. Reinstall a dry filter.

Note: Pollen Filter to be added for the patient in the case of allergies or smoking household. The filter needs to be replaced every 30 days.

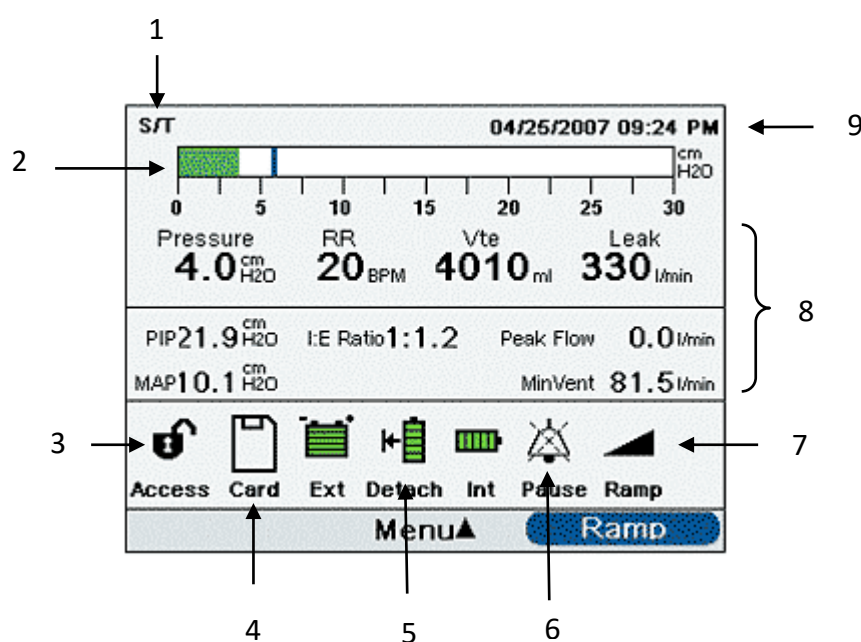


Optional: Pollen Filter placed under the grey foam filter with the print facing into the device



Grey Foam Filter

Understanding the Screen



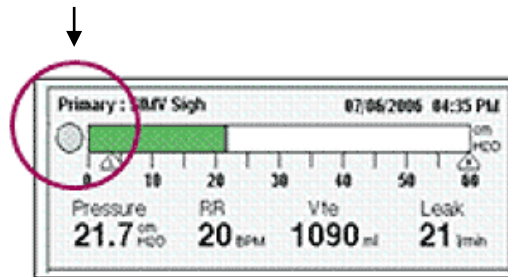
1. Ventilation Mode. Displays which mode is currently set up for use.

If more than one programme of ventilation is set the words 'Primary' or 'Secondary' also appear to indicate which programme is in use



2. **Pressure bar graph.** Next to the bar graph the below symbol is displayed each time there is a patient triggered breath

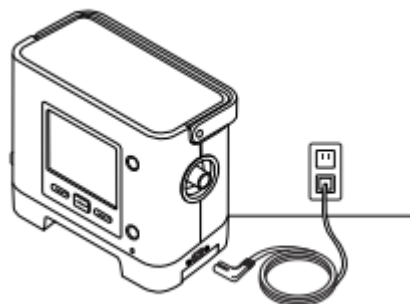
Patient Breath Indicator



3. **Padlock.** Indicates the access that the operator has. The operator can choose to allow the patient full access (can see and change settings) or limited access (can view but not change settings). The open padlock indicates 'full' access
4. **SD card.** This symbol will show when an SD card is in situ in the machine.
5. **Battery** use indicators
6. **Alarm mute** indicator (icon appears on screen when the alarm mute is active)
7. **Ramp.** In CPAP, S, S/T, T and PC modes there is an option to set a ramp meaning the pressure will gradually increase to the prescription pressure. This symbol indicates that the ramp feature is set.
8. Real time ventilation monitoring
9. **Date and time**

Power

The ventilator mains cable attaches to the side of the machine






The ventilator also has an internal battery and a detachable external battery.

It takes approximately 8 hours to charge the internal and detachable batteries. The internal and detachable batteries last for approximately 3 hours each.

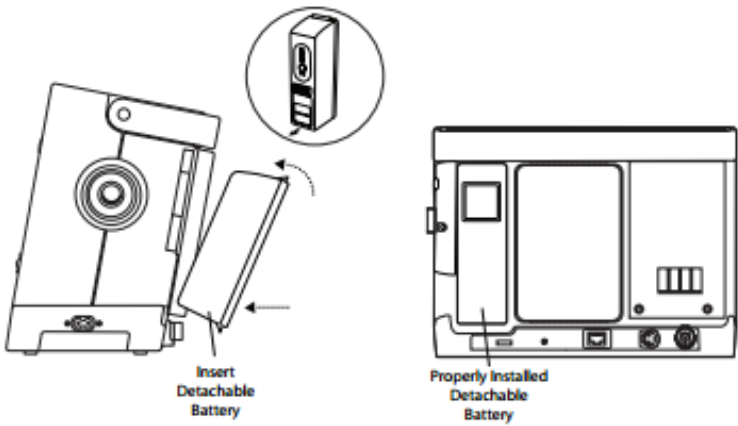
Note: Battery life may differ depending on the amount of charge and the ventilation parameters set.

It is also possible to attach the ventilator to a separate 12V battery if required. The length of time this will last will depend on the battery being used.

The following battery symbols will be displayed on the monitoring screen if they are in use:


Battery	Symbol
Internal Battery	
Detachable Battery	
External Battery	

Whenever the ventilator is attached to the mains power the internal and detachable batteries will charge.









The outside of the detachable battery has as set of LEDs' that indicate the amount of charge left on the battery.

LED	Battery Capacity
All 5 LEDs are lit	80-100% capacity
4 LEDs are lit	60-79% capacity
3 LEDs are lit	40-59% capacity
2 LEDs are lit	20-39% capacity
1 LED is lit	10-19% capacity
1 LED flashes	1 to 9% capacity
0 LEDs are lit	0% capacity



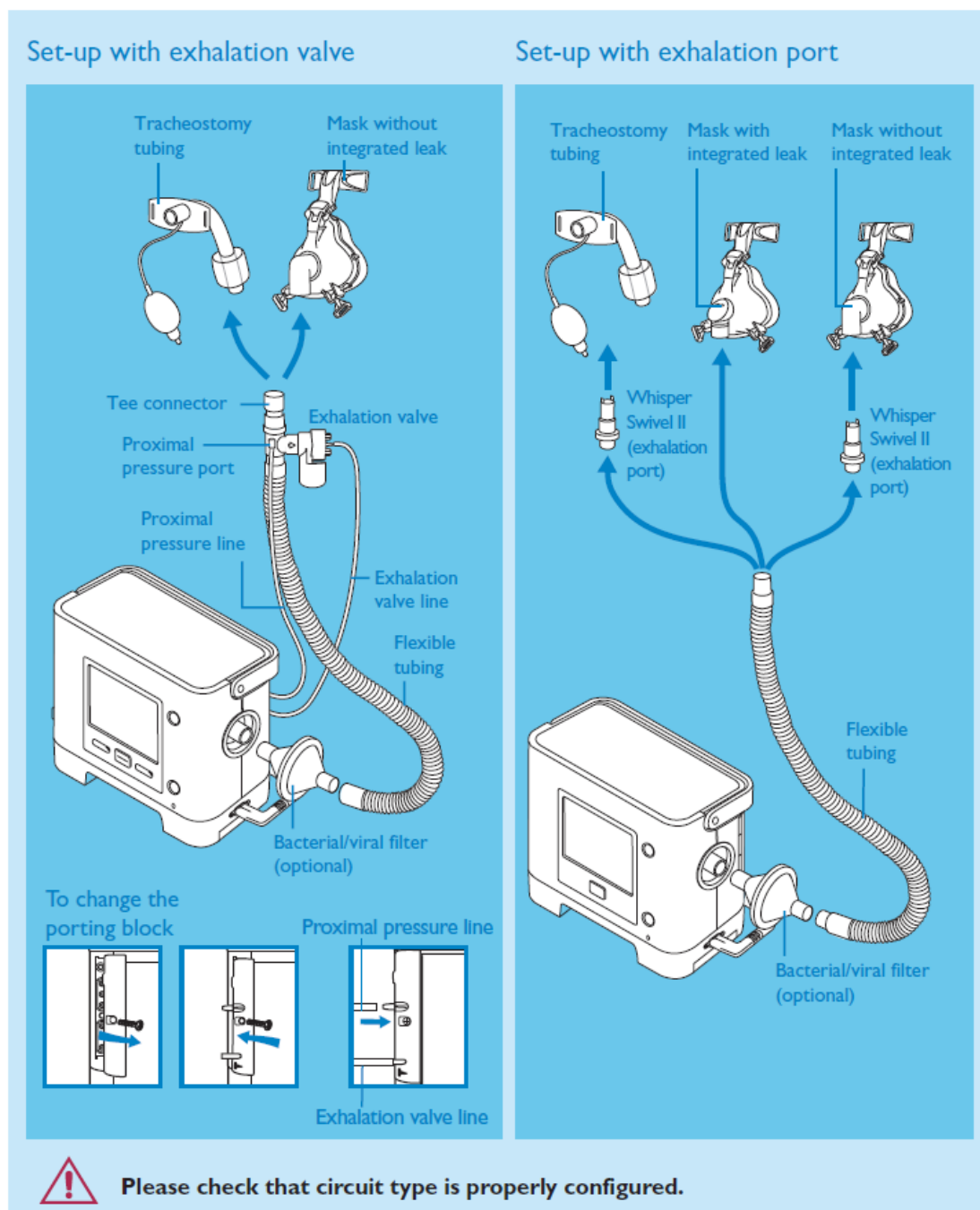
The following power indicators will be displayed on the monitoring screen to indicate the level of charge in the battery or batteries in use:

DC Power Indicator	Description
Battery In Use Indicator 	A black box will appear around the battery that is in use. For instance, if the external battery is currently in use, the  symbol appears on the Monitoring screen.
Green Fully Charged Battery Indicator	When a battery is charged to greater than 90% of its capacity, all of the bars in the battery symbol will appear in green.
Partially Charged Battery Indicator	When a battery is partially charged, some of the bars in the battery symbol will appear in green, while others will be clear. For instance, if the external battery is 50% charged, the following symbol displays on-screen: 
Yellow Low Battery Indicator (Medium Priority)	When the device detects that an in-use battery's charge is low (has approximately 20 minutes of charge left), the inside of the box surrounding the battery symbol turns yellow. (In addition to the battery indicator on the Monitoring screen, a medium priority alarm message will display indicating "Low Battery." See Chapter 6 for more information. The yellow indicator is for the last available battery source.

DC Power Indicator	Description
Red Low Battery Indicator	When the device detects that an in-use battery's charge is nearly depleted (has approximately 10 minutes of charge left), the inside of the box surrounding the battery symbol turns red. In addition to the battery indicator on the Monitoring screen, a high priority alarm message will display indicating "Low Battery." See Chapter 6 for more information. The red indicator is for the last available battery source.
Yellow Battery Recharging Symbol 	Whenever AC power is applied to the device, the internal and detachable batteries will recharge as needed. If the internal battery is being recharged, the  symbol displays. If the detachable battery is being recharged, the  symbol displays.

Types of Ventilation Circuits

There are 2 types of circuit that may be used with the trilogy ventilator. A 'passive' circuit with controlled expiratory leak and an 'Active PAP' circuit with a proximal pressure line and expiratory valve. These circuits may be sourced from a variety of suppliers (please see Trilogy Ventilator Equipment List for details of compatible circuits). The decision regarding the circuit used should be made by the treating professionals.



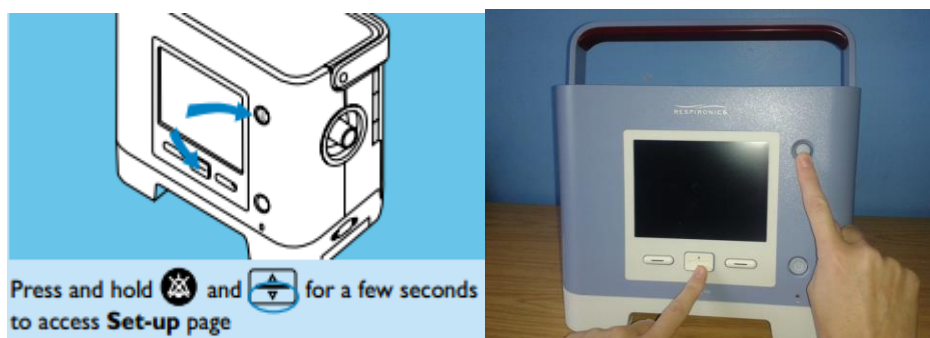
Turning On/Off

To turn the machine on and off, press the power button on the front of the machine. Ventilation will start immediately. When turning off, you will be asked to confirm you wish to power down the ventilator.

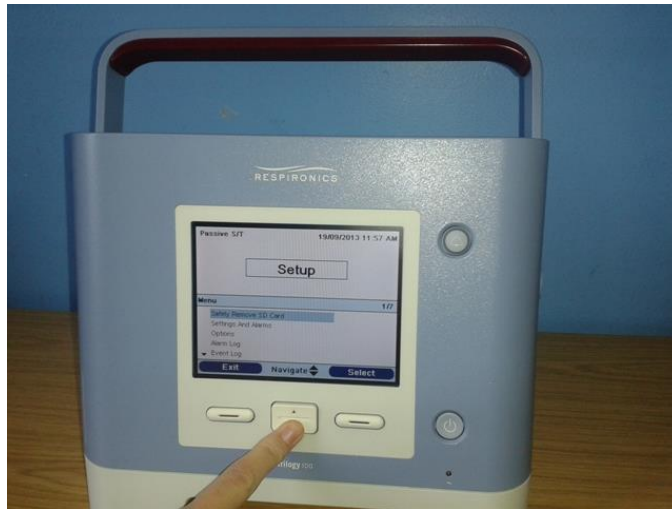


Programming Ventilation

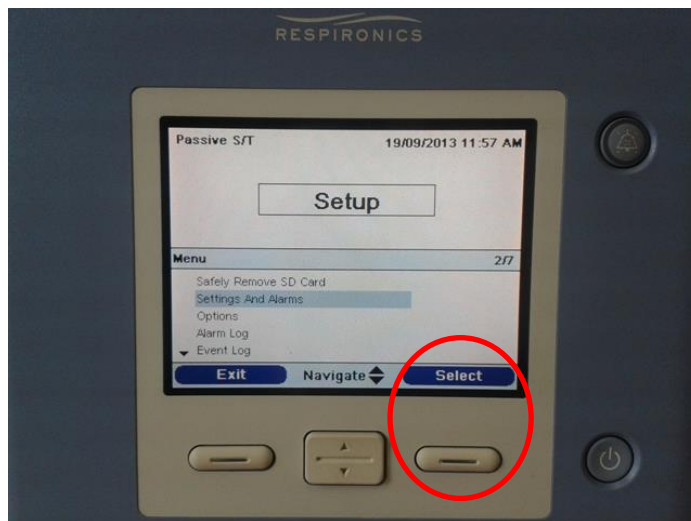
To set ventilation parameters you will need to enter the clinical menu. To enter the clinical menu when the ventilator is turned off press 'down' and the alarm mute button at the same time. The machine will then turn on in the set-up mode.



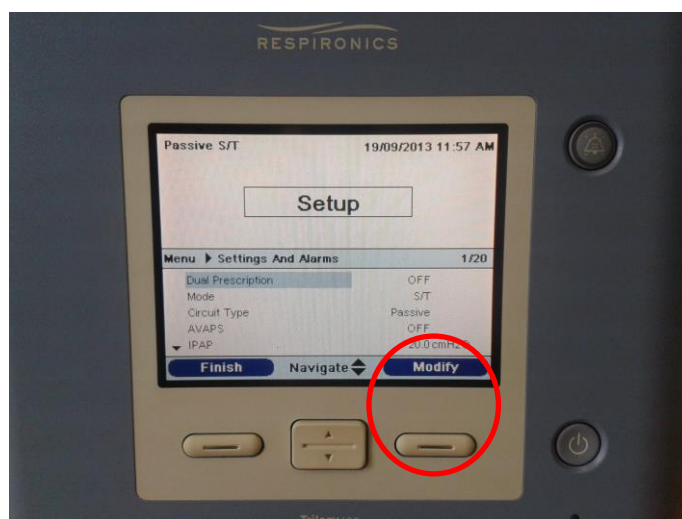
Use the up and down buttons to scroll through the menu.



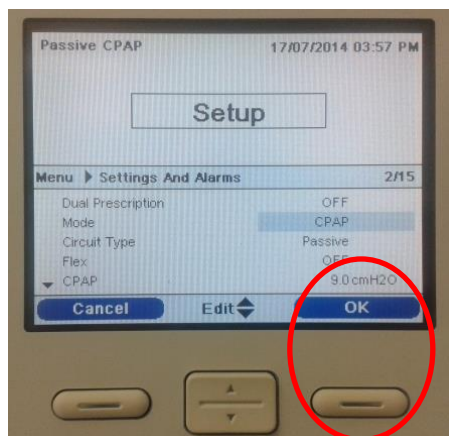
Select will allow you to enter the desired part of the menu.



'Modify' will allow you enter each part of this menu and alter the ventilator settings.

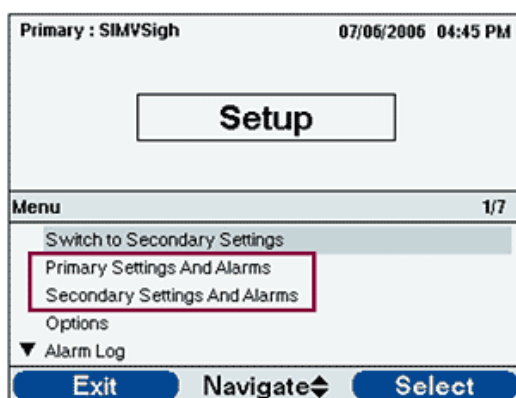


Use the up and down buttons to scroll through the parameters and then press ok to confirm your selection or cancel to move away.



Dual Prescription

It is possible to set two programmes of ventilation which may be useful for children who are weaning or whom have different ventilatory requirements from day to night. The benefit of setting two modes is that carers can switch between the modes easily without having to enter the clinical set up menu and therefore avoiding any risk of settings being programmed incorrectly.



Mode

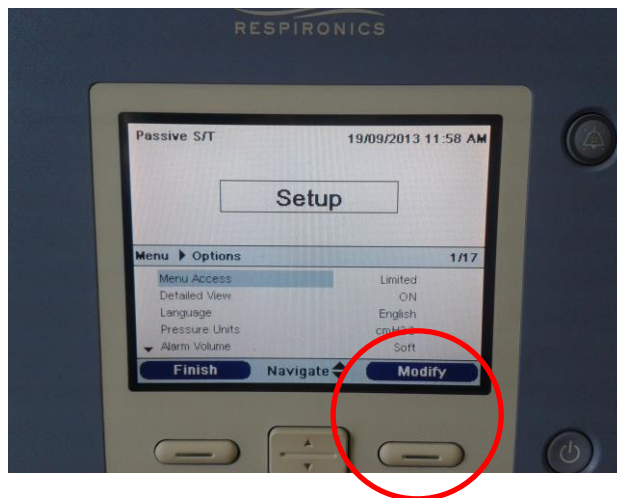
Select the appropriate ventilation mode for your patient. To select the mode you require, press modify and use the arrow buttons to scroll through the options. Press 'OK' when you have made your selection.

Next you will need to set the specific settings for your patient. Use the arrow buttons to scroll through the individual parameters for the mode you have selected, pressing '*modify*' to make a change and then 'OK' when you have made your desired change.

After setting the ventilator parameters then set appropriate alarms. *For further information on the alarms available on the Trilogy ventilator please see page 15/16*

As above, use the arrow buttons to scroll through the individual alarm parameters, pressing 'modify' to make a change and then 'OK' when you have made your desired change.

When you are satisfied with all the chosen parameters press 'finish'. You will then be taken back to the main menu.



Circuit type

The ventilator requires that you select whether you are using a 'passive' circuit or an 'active PAP' circuit.

Passive = a circuit with a controlled expiration leak in situ

Active PAP circuit = a circuit with a proximal pressure line and exhalation valve

Options

This part of the menu allows the clinician to set the date and time as well as preferences for screen brightness, language, and alarm volume. Importantly here it is also possible to set the access to information that you will permit for the patient and their carers.

If you select 'full' access – your patient and carers will be able to view and change all settings.

If you select 'limited' access – your patient and carers will be able to view only certain settings and cannot change them.

Nebuliser function

When giving a nebuliser you can enable the nebuliser function to reduce nuisance alarms that could be triggered by the nebuliser. This alarm remains active for 20 minutes while the nebuliser is given.

To activate enter the 'primary or secondary settings and alarm menu' depending on which programme you are on (see page 8).

Scroll down using the down arrow key to nebuliser enabled, select modify and select on prior to starting the nebuliser.

Once the nebuliser has been given turn off the nebuliser function by scrolling down using the down arrow key to nebuliser enabled, select modify and select off.

If using aeroneb nebuliser you will not need to use this button, only for jetsream nebulisers.

Alarm Log

Entering this part of the menu allows you to view the last 20 alarms which have been activated on the ventilator.

Event Log

Entering this part of the menu allows you to see actions that have occurred for example, attaching the battery, starting therapy, changing settings, etc.

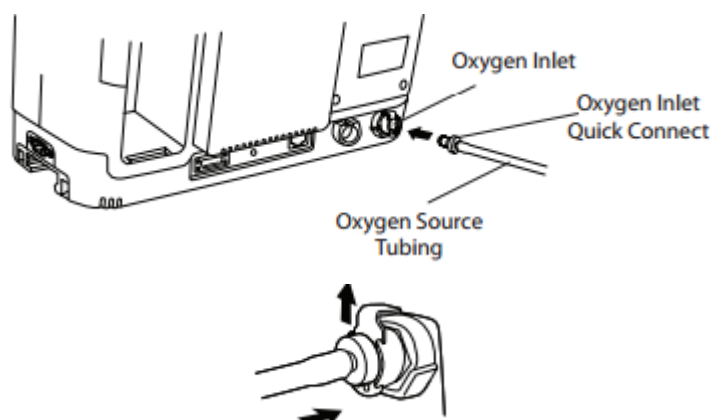
Information

This part of the menu allows you to observe the ventilator parameters which are set but it is not possible to change them in this part of the menu.

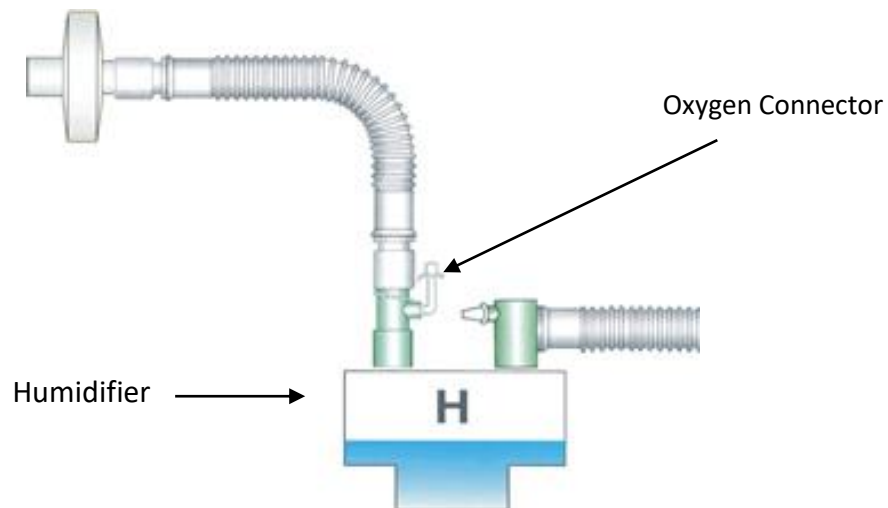
Entraining Oxygen

Supplemental oxygen can be delivered via 2 routes:

1. Connect oxygen tubing via the nozzle at the back of the machine. Oxygen flow should be manipulated via the flow meter on the oxygen delivering device you are using.



2. Deliver oxygen directly into the ventilator circuit using oxygen connector before the humidification device.



Starting and Stopping Ventilation

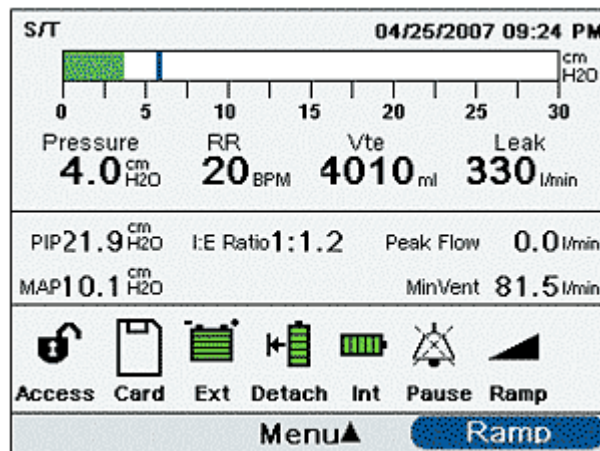
To start ventilation, press the power button located on the front of the ventilator. Ventilation will start straight away.



To stop ventilation again press the power button on the front of the ventilator. When turning off, you will be asked to confirm you wish to power down the ventilator.

Monitoring Ventilation

During ventilation the screen will display real time ventilation information.



If you wish to see trends or monitoring information over time, this information can be downloaded onto SD card and viewing on a computer providing the user has the relevant software.

Altering Parameters

To alter parameters, you need to enter the clinical menu. This can be done whilst the ventilator is turned off or whilst the ventilator is running. *Please see page 7* for details of how to enter the clinical menu.

Use the up and down buttons to scroll through the parameters. 'Modify' will allow you enter each part of this menu. Again, use the up and down buttons to scroll through the options and then press ok to confirm your selection or cancel to move away.

Setting Alarms

To set alarms, you need to be in the clinical menu. This can be done whilst the ventilator is turned off or whilst the ventilator is running. *Please see page 7* for details of how to enter the clinical menu.

Use the arrow buttons to scroll through the individual alarm parameters, pressing 'modify' to make a change and then 'OK' when you have made your desired change.

Testing Alarms

Alarm Checks - Must be carried out at the beginning of/during each shift.

- When tubing is first disconnected check that low pressure, disconnection **or** low tidal volume alarms are triggered
- Occlude the ventilator circuit whilst running and check the disconnection, high pressure, occlusion **or** low tidal volume alarms are triggered

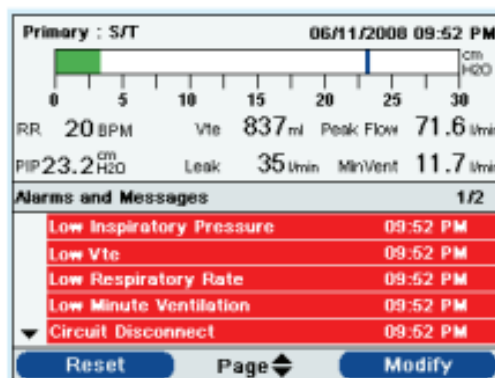
Activated Alarms

When an alarm is activated the ventilator will provide both audible and visual alerts. A message is also displayed detailing the nature of the alarm.

When an alarm occurs the LED indicator on the alarm mute button lights up, there is also an audible sound and a message appears on the screen describing the type of alarm.

There are 3 alarm priorities:

- **High Priority:** Require immediate response by the operator, the alarm mute button will flash red, and the screen message will appear red.
- **Medium Priority:** Require prompt response by the operator, the alarm mute button will flash yellow, and the screen message will appear yellow.
- **Low Priority:** Require operator awareness, a solid yellow light appears on the alarm mute button and the screen message also appears yellow



If an alarm is manually reset by the user, the alarms and messages screen disappear. If an alarm self-cancels, the alarms and messages screen remains displayed, but the highlighted

colour disappears, the LED behind the mute button is unlit and the sound stops. It is therefore possible to see what the last alarm was if it self resolves.

If multiple alarms are activated, all alarms are shown in the alarms and messages box with the most recent at the top.

To mute an alarm, press the alarm mute button on the top right-hand corner of the ventilator. The alarm will be silenced for 60 seconds and then will sound again if the cause of the alarm has not been corrected. When the alarm is muted this will be indicated on the screen by this icon



After a situation causing an alarm has been resolved press the reset button to clear the alarms from the display.

Understanding Alarms

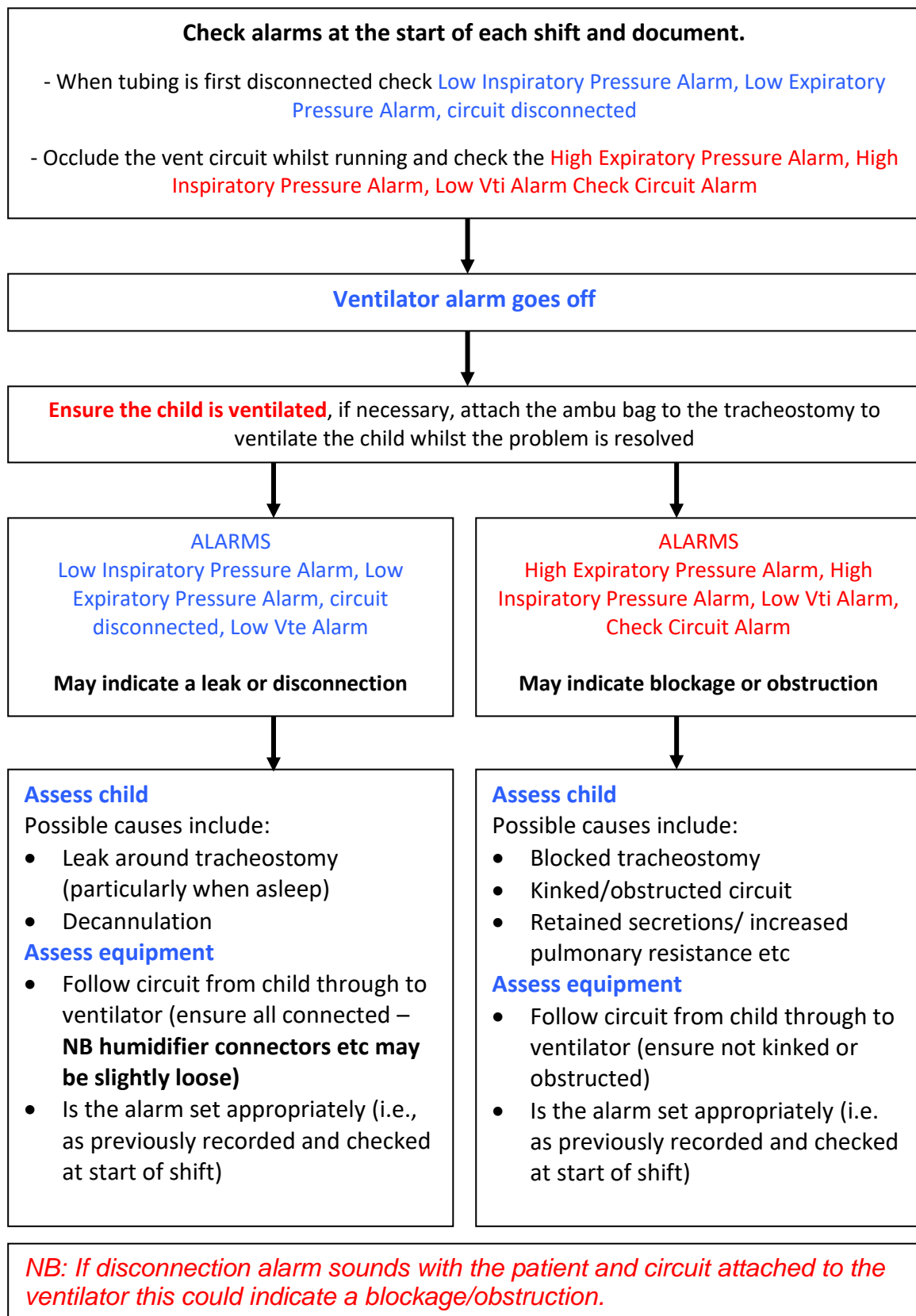
Trilogy 100: Possible Alarm Causes and Actions

Low minute ventilation alarm, Low Inspiratory Pressure Alarm, Low Expiratory Pressure Alarm, circuit disconnection alarm may indicate a leak/ disconnection		High minute ventilation alarm, High Expiratory Pressure Alarm, High Inspiratory Pressure Alarm, Low Vti Alarm, Check Circuit may indicate a blockage or obstruction	
Assess child Accidental decannulation (i.e., tracheostomy has come out)	Action <ul style="list-style-type: none"> Immediately insert tracheostomy If difficultly follow Emergency algorithm 	Assess child Increased work of breathing (Respiratory rate is increased is this due to child being unwell) (Respiratory rate increased due to excitement, crying, upset, coughing, hiccups, pain, or discomfort)	Action <ul style="list-style-type: none"> Suction, consider need for nebulisers, physiotherapy Refer to advanced treatment plan D/w community or medical team Monitor child. Address issues if possible, e.g., reposition, administer pain relief
Assess child Leak around tracheostomy (particularly when asleep)	Action <ul style="list-style-type: none"> Some leak may be tolerated and may be due to position of child so can try repositioning 	Assess child Retained secretions/ increased pulmonary resistance etc	Action <ul style="list-style-type: none"> Suction, consider need for nebulisers, physiotherapy Refer to advanced treatment plan D/w community or medical team
Assess equipment Disconnection within circuit (Follow circuit from child through to ventilator and ensure everything is connected)	Action <ul style="list-style-type: none"> Reconnect any loose connections Re-assess 	Assess equipment Circuit blockage (Follow circuit from child through to ventilator and ensure it is not kinked or obstructed)	Assess child <ul style="list-style-type: none"> Correct fault Re-assess
Is the alarm set appropriately (i.e., as previously recorded and checked at start of shift)	Check alarm settings are as prescribed and re-set if any discrepancies	Is the alarm set appropriately (i.e., as previously recorded and checked at start of shift)	Check alarm settings are as prescribed and re-set if any discrepancies

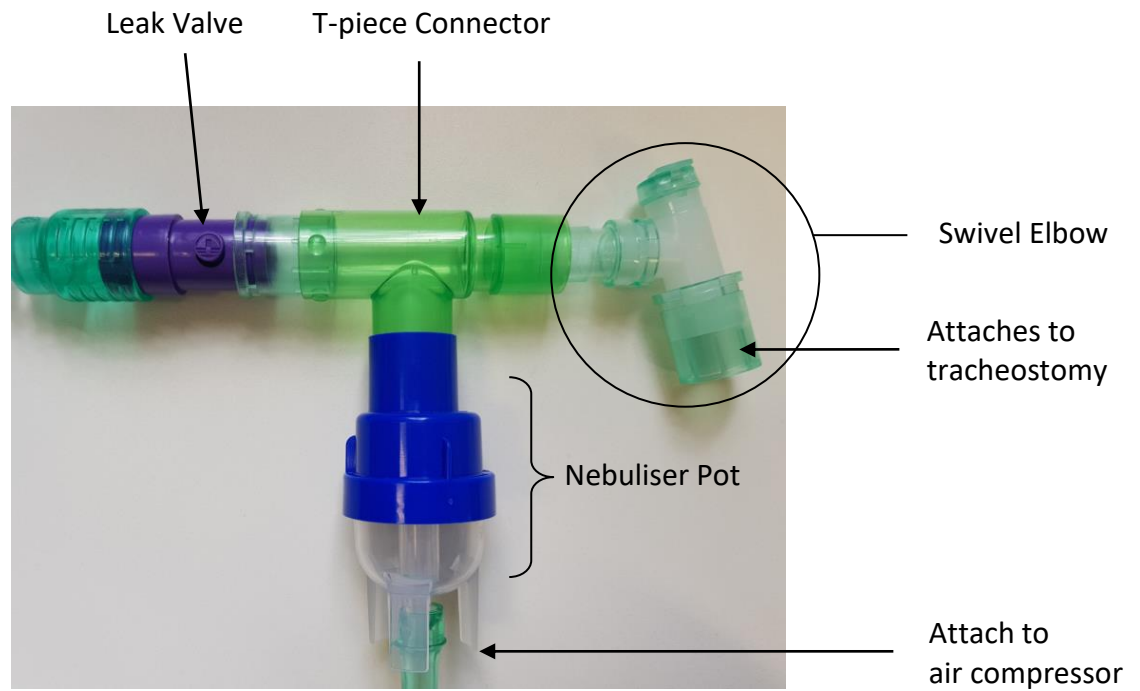
Low circuit leak alarm-Check exhalation value is not blocked or covered and within circuit.

If the child is compromised and you can't resolve the issue rapidly – hand ventilate and call for help

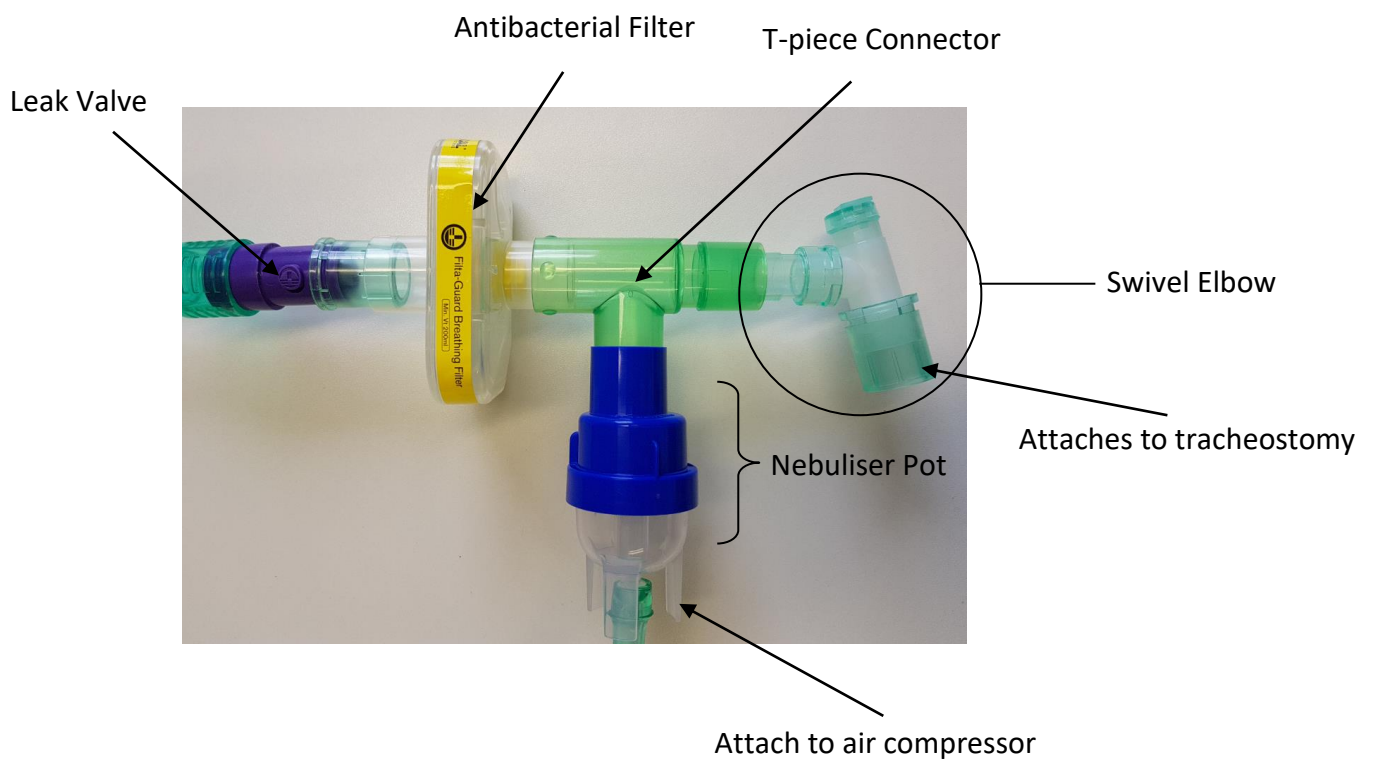
Troubleshooting Trilogy 100 Alarms



Giving Nebulisers



For Nebulised Antibiotics. (Please check your local policy on whether antibiotic nebulisers require filtering)



Consumables:

- Antibacterial filter should be changed weekly at home – see local policy for hospital setting
- Dust filters should be checked weekly and washed with warm water with a mild detergent. Changed every 6 months or sooner if needed
- Breathing circuit should be changed weekly
- As optional, pollen filter should be changed monthly or sooner if needed

NOTE: Please see equipment list for ordering information

Ventilator Tips:

- Allow a period for a ventilator to do its self test prior to connecting to the child
- Check the alarms prior to connecting the child to the ventilator.
- If 24-hour ventilation is required, the patient should have a back-up ventilator ensuring equal usage to both ventilators.
- Lock the machine after the appropriate settings are entered to avoid accidental tampering.

Useful Contact Information

For further advice on the Trilogy ventilator machine on the phone during week working hours:

Philips Healthcare

Philips Electronics UK Limited, Ascent 1, Aerospace Boulevard, Farnborough, GU14 6XW
Customer Services: +44 800 1300 845

Check your service agreement for your options.