

# Using your Astral Ventilator for Bi-Level ventilation (children)

## Children's Respiratory Physiology

Information for Patients

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### Introduction

We use Bi-Level ventilation to treat many conditions. It supports breathing and removes excess carbon dioxide (CO<sub>2</sub>) from the lungs. We can sometimes use it to keep your airways open. These machines deliver air through tubing and into a mask or tracheostomy.

Bi-Level helps you breathe while you sleep by gently pushing air through a mask over your nose and or mouth, or a small opening in your neck tracheostomy. It can also be used when you are awake to help your breathing. It has 2 different pressures:

- **IPAP** is a higher pressure that helps the lungs inflate.
- **EPAP** is a lower pressure that helps the breath out whilst keeping the airways open.

### What should my child expect when using Bi-Level?

Most of the time, the Astral works with how your child normally breathes. It matches their breathing and gives air when needed. If your child's breathing slows down, it may give your child extra breaths. It is normal for it to take sometime for your child to get used to this feeling.

If your child wakes in the night and feels uncomfortable with the pressure of the machine, switch it off and disconnect it for a few minutes. Wait until your child is comfortable before switching the machine back on.

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or call 111 for non-emergency medical advice**

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## How do I use the ventilator?

The ventilator has a small internal battery for emergency use. Make sure the ventilator stays plugged into the mains when being used.

- **The power switch (1)** on the back of the ventilator will switch the ventilator on. But it will not start Bi-Level ventilation.
- **The 'hand' (2)** button will unlock the touch screen.
- **The 'start vent' (3)** button will start Bi-Level. To stop Bi-Level, press and hold the 'stop vent' button. Then let go of the button when shown on screen.
- **The 'lung' button (4)** will show you monitoring data whilst your child is on Bi-Level. You can use this to check leak and make sure the right pressure is being delivered.
- **The 'tick' button (5)** will show you the Bi-Level settings. You will not be able to change these.
- **The 'bell' button (6)** is where you will find all alarms set.
- **The 'i' button (7)** is a log of all alarms.
- **The red button (8)** is the alarm mute button.



## The Astral Bi-Level circuit

The things you need to use the ventilator include:

- The Astral ventilator and mains cable
- Circuit Tubing
- A close fitting mask worn over the mouth and/or nose. It needs to have ports that lets the exhaled air escape. If you have a tracheostomy, the air will escape through the leak valve.
- Humidifier (optional)

## How do I set up the circuit?

### Non-Humidified Circuit

1. Plug the Astral into the power supply.
2. Connect the tubing to the front of the ventilator.
3. Connect the mask to the opposite end of the tubing.
4. Perform learn circuit.

### Humidified Circuit

1. Plug the Astral and humidifier into the power supply.
2. Place the chamber into the humidifier .
3. Connect the yellow filter to the front of the ventilator. Then place the short tubing onto the filter. Attach the other end of the tubing to the chamber.
4. Attach the long tubing to the humidifier chamber and the mask.
5. Connect humidifier temperature probes and water supply as shown during training.
6. Perform learn circuit.

## How do I learn the circuit?

You can minimise alarm issues by learning the circuit resistance.

- Make sure the Astral is powered on.
- The parts should already be put together. You will need to take remove it from the front of the ventilator for the first stage. The mask should not be joined to the tube yet.
- Select the 'tick button' > circuit > learn circuit start and follow prompts.
- Mask can be added to circuit once completed.

## How do I clean the Astral?

You must clean the Astral machine and circuit regularly. This reduces the risk of infection and damage to the equipment.

### Daily:

Disconnect your child's mask from the tubing each morning. Wipe the inside of the mask with a wet wipe/baby wipe. Leave mask to dry off before using again. Do not use bleach or alcohol based products. These can damage the masks.

### Weekly:

Some circuits (tubing and humidifier chamber) need to be changed weekly, monthly or 6 monthly. The community team will tell you which how often you need to change it. They will also give you the supplies you need.

Wipe the Astral down with a damp cloth/baby wipe to keep it dust/dirt free.

### Monthly:

There is a filter in the back of the Astral to collect dust. You should check this every month. If visibly soiled it should be changed. The filter must be changed after 6 months. This is if you have not changed it already.

### To change the filter:

1. Unlock the air filter cover by turning in an anti-clockwise direction.
2. Pull the air filter cover from the device.
3. Pull the air filter from the cover and discard.
4. Insert a new filter into the cover.
5. Insert the air filter and cover back into the device.
6. Turn in a clockwise direction to secure in place.



## How do I check my child's mask fit?

Your child's mask must be fitted well to make sure they get the pressure they need.

Your child's mask should be tight enough to be secure and have minimal leak. Be careful not to over tighten and cause discomfort and soreness.

### To check if the mask fits:

- Move your hands around the mask. There should be no excessive air leaking from where the mask touches your child's face.
- Each mask has a little leak to let CO<sub>2</sub> escape. This is different on every mask. You should have been shown where it is.
- Check the leak level on the monitoring (I button). If this number is above 40, then try adjusting the mask to reduce leak.
- If you notice a high leak try moving the placement of the mask on the child's face or adjusting the straps may improve mask fit.
- If you are struggling often with mask fit or leak, please contact children's respiratory physiology.

## Alarms

Alarms are set on the Astral device for safety. We tailor the alarms to every patients need's so some of these alarms may be turned off. An active alarm will be displayed along the top of the screen.

- **Red** alarms are **high** priority alarms.
- **Yellow** alarms are **medium** priority.
- **Light blue** alarms are **low** priority.

You can mute the alarm for two minutes using the alarm mute button. It will continue to sound every two minutes until the problem is fixed. Please contact the physiology team if you are having problems with alarms.

## Common alarms

- **High leak:** This may appear if the mask is not correctly fitted. This happens when the mask has been removed or if the circuit is not correctly assembled.
- **Apnoea alarm:** This may appear if your child holds their breath. This should self-clear. If this is repeatedly sounding please check mask fit or contact physiology.
- **Disconnection Alarm:** This will sound if your child has removed their mask.
- **Internal battery:** This will sound if the internal battery is being used. Check that the mains cable is correctly inserted and is turned on at the plug.

## Common problems

**Runny nose, dry nose, mouth or throat:** All of these issues are quite common. These symptoms do settle in a few days. If the symptoms continue please contact the Respiratory Physiology Team on the number at the back of this leaflet.

**Blocked nose:** If your child is using a nasal mask, they may not feel the benefit of using Bi-Level. They may need to breathe through their mouth until their nose has cleared. This is why we often try to offer masks covering nose and mouth.

**Broken mask:** If your child's mask has broken, please contact the community team for a replacement.

**Machine does not seem to be working correctly:** If you think your equipment is malfunctioning please contact the respiratory team.

**Mask rubbing on skin:** Sometimes the mask can rub on your child's skin making it sore. To help this you can try some moisturiser on your child's skin to see if this will help the skin at all.

## Saturations monitoring

We may have requested that the community team give you a saturations monitor. This will depend on your child's age and needs.

You should use the saturations monitor at all times whilst your child is using the ventilator. It is for safety and to alert you if there is something wrong. If your child is moving or the probe is not attached correctly it may not be accurate.

The nursing team will let you know how to use the saturations monitor. They will help you know when there is something to be concerned about.

## Oxygen use

If your child needs oxygen as part of their therapy or in an emergency, you are able to connect your oxygen concentrator/ cylinder to the Astral device. This will let both oxygen and Bi-Level to be given at the same time.

You will have been given an oxygen connector that goes into the back of the Astral. You then attach your oxygen tubing to this.

The community team are responsible for this monitor and any probes needed.





## Do I need to bring the ventilator with me to hospital appointments?

Bring your child's Astral with you to any appointments relating to their ventilation. For example, if your child has a follow up appointment in the respiratory or sleep clinic to see the Doctors, Nurse or Physiologists.

For these appointments you do not need to bring the complete circuit and humidifier. You should bring the Astral machine, mains power cable and mask unless asked otherwise.

If your child has to visit hospital for an overnight stay for any reason, you will need to bring their ventilator, mask, circuit and humidifier with you. This is very important as we do not have spare machines to loan to the wards.

You must let the Doctors and Anaesthetists know that your child is on ventilation. This is important if your child is going to have a general anaesthetic as they may need ventilation after their procedure.

## What if I am going on holiday?

Your child can take their ventilator on holiday with them.

If they are flying, the ventilator needs to be carried as hand luggage. This stops it from getting lost or damaged. It must not be transported in the hold. Please contact the respiratory nursing team and they will give you a flight letter to let you do this.

If you are flying overnight, it is likely that your child will need to use the ventilator whilst flying. Please contact us to arrange this.

Some children will need a flight assessment before flying. If your child needs oxygen or you have been told that your child needs a flight assessment, please speak to the respiratory nursing team before booking your flight.

## Contact details

Childrens Respiratory Physiology, Childrens Development Centre, Ground Floor, Windsor Building, Leicester Royal Infirmary, Monday to Friday, 8am to 4:30pm on **0116 258 5691**.

Please arrange an appointment before attending.

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