

User Guide to Your Child's Home Ventilator (Astral)

Astral At A Glance...



1. Carry handle
2. Inspiratory port. The breathing circuit will attach here, carrying air to your child.
3. Expiratory port/circuit adaptor (Astral 150 only). This port varies according to the expiratory circuit adaptor that is set up.

7. Power port (for AC power supply or external battery/batteries)
8. On/Off button
11. Oxygen port (0-30L/min low flow O₂)
12. Air inlet (where air enters the ventilator)

Disclaimer: This guide is based on the Resmed Astral User Guide, focusing on the most common functions. It is intended to aid a carer who has/is receiving training. It should be used in conjunction with other guides, including those on Setup, Maintenance, Circuits and the manufacturer's own User Guide.

Indications: The Resmed Astral 100/150 ventilators are intended for home and hospital respiratory support of children weighing over 5kg by tracheostomy or non-invasive interface. They are licensed as life support but not as transport ventilators and should only be used under the guidance of a physician. While the Astral will operate in a wide range of conditions, effective humidification may be more challenging at outside of the 18-26 °C temperature range. These ventilators are licensed for use during air/road travel.

Powering the Astral

The Astral may be powered by its internal battery, additional external batteries, by mains power (110/230v AC), or the car adaptor. Internal and external batteries are expected to power the device for up to 8 hours each, but results may vary. As no power source is completely reliable all the time, if your child is dependent on the ventilator, it is recommended that they have at least two sources of power available at all times, for example: mains + internal battery, or the internal + an external battery.

Connecting to wall (mains) power

1. Connect the DC plug of the supplied ResMed external power supply unit to the rear of the Astral device.
2. Before connecting the power cord to the ResMed power supply unit, ensure the end of the connector of the power cord is correctly aligned with the input socket on the power supply unit.
3. Plug the other end of the power cord into the power outlet.



Note: The power cord is equipped with a push-pull locking connector. To remove, grasp the power cord housing and gently pull the connector from the device. Do not twist its outer housing or pull on the cord.

Powering the Astral

Connecting to an external battery:

- To connect an external battery: plug its cord into the Astral power port (instead of the mains power).
- A fully charged external battery can provide an additional 8 hours of power during typical use. An additional external battery can be plugged into the first external battery giving a total potential 24 hours battery life. The mains power can be plugged into the free battery port.
- The ventilator will run off the mains while power is connected and charge the internal then external batteries. It will switch automatically to battery power if mains power fails.



To turn on:

1. Press the green button at the left rear. After a 2-second delay, the screen will power up.

To turn off:

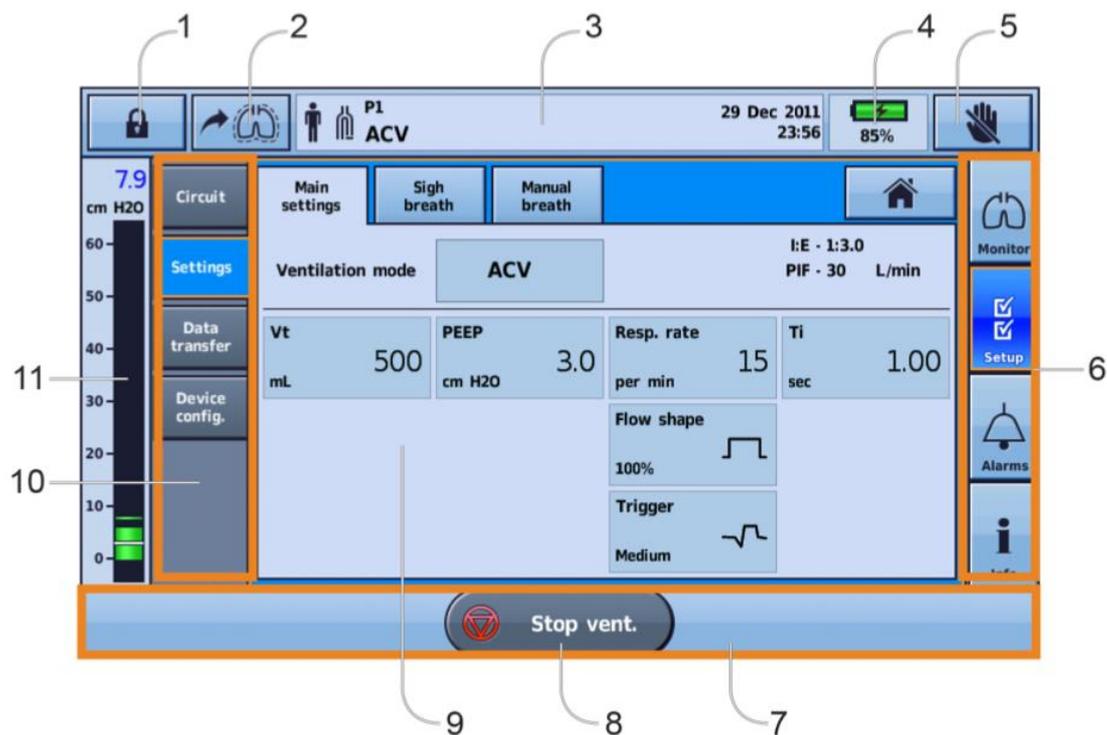
1. Stop ventilation (ensuring your child is safe and/or on alternative ventilation).
2. Stop any oxygen running into the ventilator.
3. Press the green button at the rear. The ventilator will prompt you to confirm oxygen is off and, once accepted, will power down.

The Astral Touchscreen

1. Touchscreen
2. Power source being used
 - AC – mains
 - DC – external battery/adaptor
 - Battery – internal battery
3. Indicator light
 - Green – standby
 - Blue – ventilating
4. Alarm light/mute button
5. Alarm light (varies with alarm priority, but all alarms should be responded to immediately).

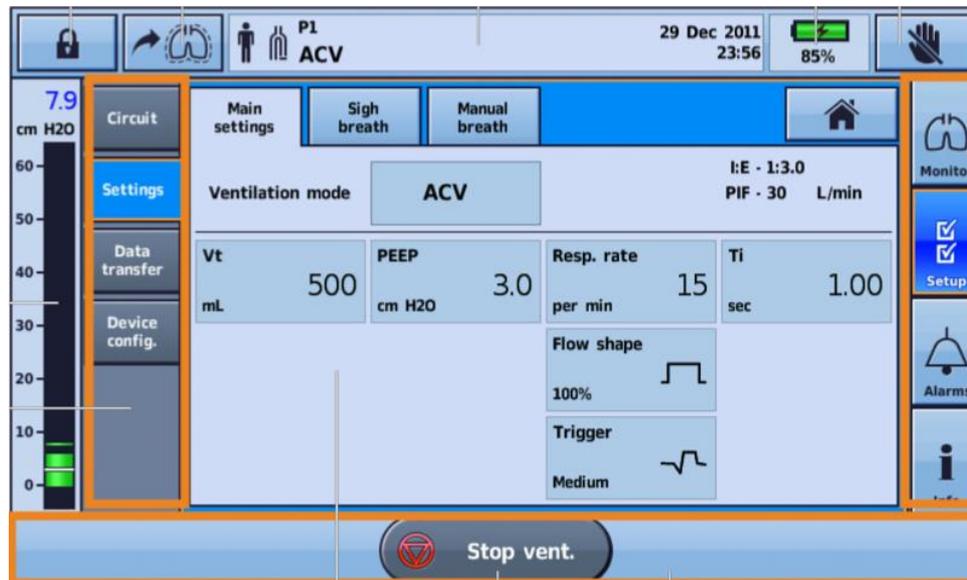


The Astral Touchscreen



1. Clinical menu (shown locked)
2. Manual breath button (if activated)
3. Information bar showing: paediatric  or adult  setting, circuit type (see Circuits Guide), programme (P1-P4) and ventilator mode.
4. Internal battery power – as a percentage or hours remaining. A lightning bolt symbol indicates it is charging
5. Screen lock button (locks screen)
6. Main menu side bar
7. Bottom bar
8. Start/Stop Ventilation button
9. Main screen where a variety of information is shown and settings may be adjusted
10. Sub menu side bar
11. Pressure display – shows rise and fall of pressure delivered to your child. A  symbol at the bottom indicates a spontaneously triggered breath.

The Astral Touchscreen



Main Menu side bar (right of touchscreen):

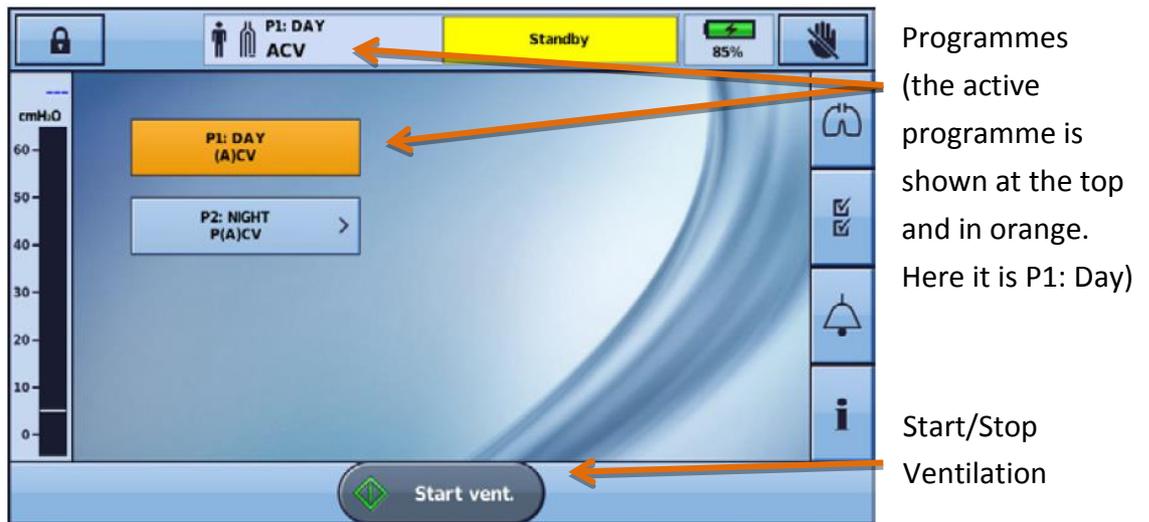
-  Information about ventilation being delivered
-  Settings for current programme
-  Alarms
-  Log of alarms and changes made

Sub Menu side bar (left of touchscreen):

Displays sub menus that vary according to what is selected on Main Menu side bar above.

Selecting A Ventilation Programme

Depending on the model, the Astral may have 1-4 pre-set programmes. Each has its own settings, alarms and circuit setup and is labelled P1-P4 together with a word describing its role. The active programme is shown in the Information bar at the top. Use a wall chart and/or stickers on the ventilator to remind you what the different programmes are for.



In the home screen (above) the available programmes (here P1 and P2) are displayed with the active programme in orange. To change between programmes, press on the desired programme and follow the prompts.

To return to the 'home screen' at any time, press on the  at the top right of the screen.

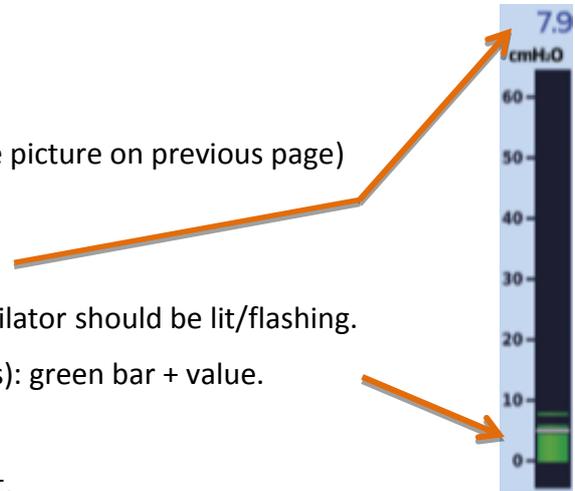
Unlocking the screen:

Touch the screen and choose 'yes'. It will re-lock automatically.

Starting And Stopping Ventilation

Starting ventilation

- Turn on the ventilation and check the setup
- Start by pressing the  button (see picture on previous page)
- Check ventilation has started:
 - Check for airflow/pressure in circuit.
 - The blue indicator light on front of the ventilator should be lit/flashing.
 - The screen indicates appropriate pressure(s): green bar + value.
- Add oxygen if available
- Check your child is breathing properly and is alright.



Stopping ventilation

- Turn off oxygen if connected
- Press and hold the  button (see picture on previous page).
 - Release when prompted.
 - Press 'confirm' to stop ventilation.
 - The ventilator may alarm (if set).
- Check ventilation has stopped
 - Absence of airflow/pressure in circuit
 - Indicator light turns green ('ready')
 - Screen indicates no pressure delivered (green bar)
- Check your child is supported and their breathing is alright.

Adding Oxygen To The Astral

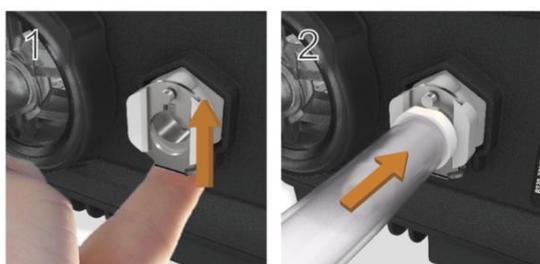
The air around us is around 21% oxygen. If needed, extra oxygen ('low flow') can be added via the port at the rear of the Astral from the wall, bottle or a concentrator. Flows can be up to 30L/min (up to 6 L/min if it is in its travel bag).

Never leave oxygen running if the ventilator has stopped or during a 'learn circuit'.

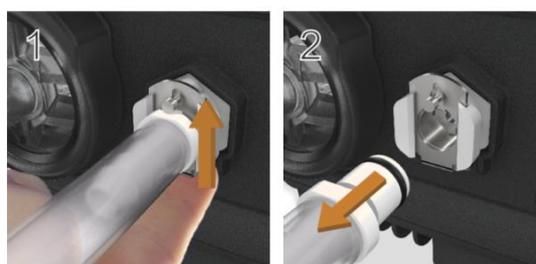
To add oxygen:

1. Push the white oxygen connector into the ordinary oxygen tubing.
2. Press up on the oxygen inlet locking clip at the rear while inserting the oxygen adaptor/tubing into the port (see below). It will lock into place.
3. Start ventilation (see previous page).
4. Now start the oxygen. Adjust the oxygen flow as per your health team's advice.

Adding oxygen at the back:



Removing oxygen at the back:



To remove oxygen:

1. Oxygen flow must be stopped when the ventilator is off, in standby, or being removed.
2. Press up on the oxygen inlet clip and withdraw the tubing (above).

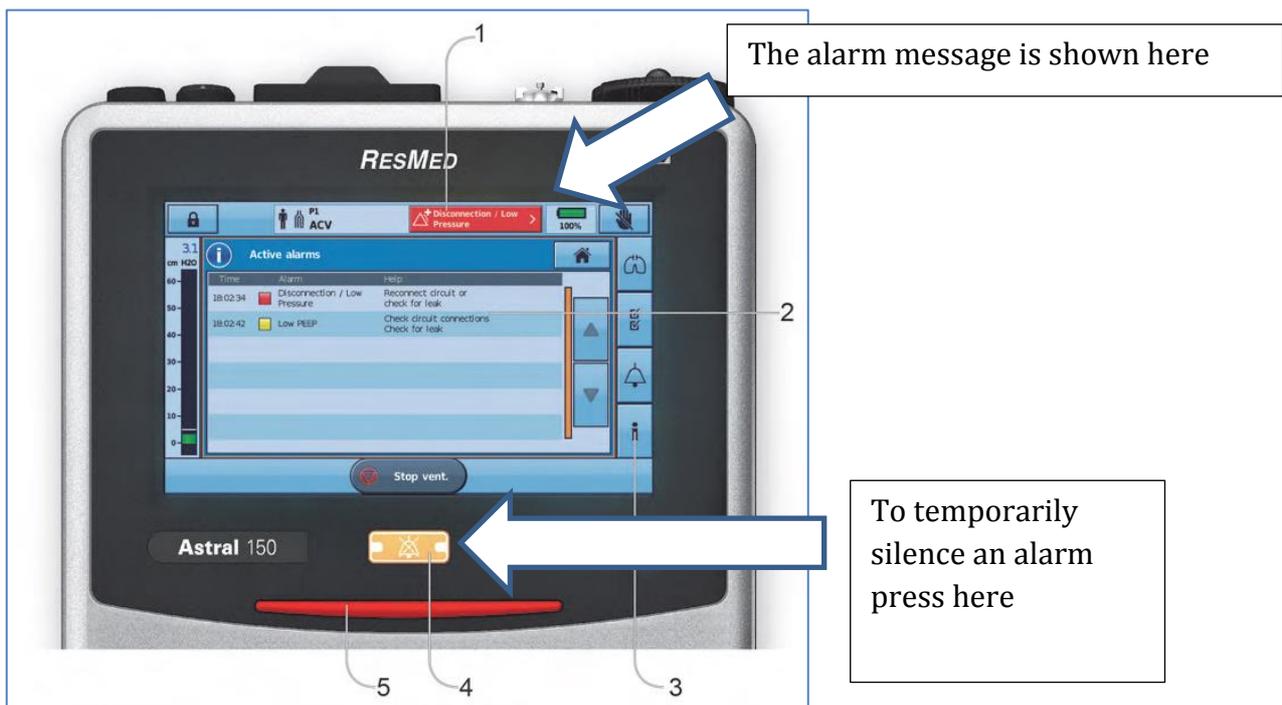
Note: Depending on your child's needs, it may be easiest to leave an adaptor in the port.

Alarms On The Astral

Your child's ventilator has alarms to warn you of potential problems. Your health team will adjust them for your child. There is no perfect alarm to let you know everything that could be happening, so a child dependent on a ventilator may still need other monitoring (e.g. oximetry) and/or someone awake to care for them.

The alarms can be adjusted to sound when they are needed, but to minimise nuisance false alarms. Most alarms are there to help identify if the breathing circuit, mask or tracheostomy get disconnected or blocked.

Always respond immediately to alarms



To **silence an alarm** press on the  button (arrowed above). If you are going to do something that you know will produce an alarm (e.g. suctioning) you can press this before to 'pre-silence' the alarm.

If you get an unusual or troublesome alarm and need to speak with your health team about it, try to write down the exact message or take a picture with your smartphone. This will help them understand the problem.

Common Astral Alarms

See the User Guide and talk to your health team for further information.

Message	What it means
<p>Disconnect</p> <p>Circuit compliance has exceeded a preset maximum</p>	<p>Has the breathing circuit disconnected? Has a tracheostomy tube come out or the mask come off?</p> <p>This alarm will sound if the ventilator thinks it is too easy to push the air out.</p> <p>Check your child, the circuit and tracheostomy/mask.</p>
<p>Low Pressure</p> <p>Less than ½ set PIP achieved</p> <p>Low PEEP</p> <p>PEEP is 2cm below preset.</p>	<p>Has the breathing circuit disconnected? Has a tracheostomy tube come out or the mask come off? Has leak increased for some reason?</p> <p>These alarms will sound if the ventilator can't even nearly achieve its set pressures.</p> <p>Check your child, the circuit and tracheostomy/mask.</p>
<p>High Leak</p> <p>Leak (% of VTi not returning) exceeds preset level.</p> <p>Not always available/enabled</p>	<p>Has the breathing circuit disconnected? Has a tracheostomy tube come out or the mask come off? Has leak increased for some reason?</p> <p>This alarm will sound if the ventilator can't even nearly achieve its set pressures.</p> <p>Check your child, the circuit and tracheostomy/mask.</p>
<p>High Vti / High Mvi</p> <p>Inspiratory VT or MV are above limits</p> <p>Not always available/enabled</p>	<p>Has the breathing circuit disconnected? Has a tracheostomy tube come out or the mask come off?</p> <p>This alarm will sound if the breaths delivered are much bigger than expected.</p> <p>Check your child, the circuit and tracheostomy/mask.</p>

Common Astral Alarms

See the User Guide and talk to your health team for further information.

Message	What it means
<p>Low Vti / Low Mvi</p> <p>Inspiratory VT or MV are below limits</p> <p>Not always available/enabled</p>	<p>Is the circuit, tracheostomy or mask occluded (blocked)? Has something come off or been disconnected? Is your child well?</p> <p>This alarm will sound if the breaths delivered are much smaller than expected.</p> <p>Check your child, the circuit and tracheostomy/mask.</p>
<p>Low Vte / Low Mve</p> <p>Expiratory VT or MV are below limits</p> <p>Not always available/enabled</p>	<p>Is the circuit, tracheostomy or mask occluded (blocked)? Has something come off or been disconnected? Is your child well? Has leak suddenly increased for some reason?</p> <p>This alarm will sound if the breaths returning to the ventilator are much smaller than expected.</p> <p>Check your child, the circuit and tracheostomy/mask.</p>
<p>Battery alarms</p>	<p>Battery may be not in place or faulty. Check position of battery, replace if needed.</p>

For more information on alarms and error codes, see the Troubleshooting Guide and/or pages 65-72 of the Resmed User Guide.