Use of portable ventilators in the RSCH or RACH emergency departments

Choosing the correct ventilator for the child

The Oxylog 3000 is suitable to ventilate children weighing > 15kg. For children < 15kg, use the Babypac ventilator.

Oxylog 3000 ventilators are stored in the ventilator cabinet in the resuscitation room of the RACH CED, and in the resuscitation room of the RSCH ED. There is only one Babypac ventilator, available in the ventilator cabinet in the resuscitation room of the RACH CED.

Using the Oxylog 3000 ventilator

1. Ensure the required cables are attached to the oxylog 3000

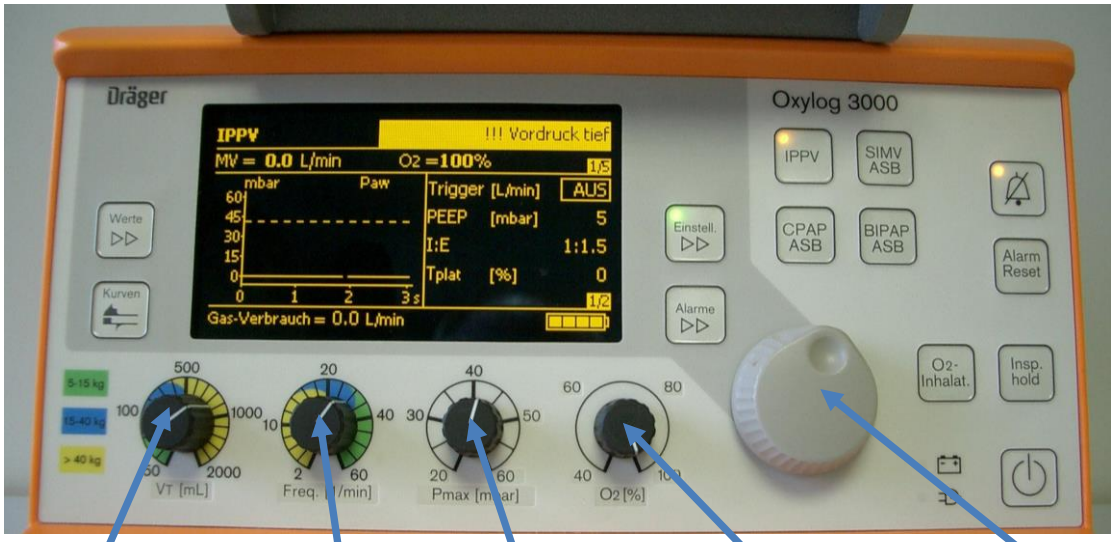
- Connect the black oxygen cable to the wall oxygen or a full CD oxygen cylinder using the Schraeder valve.
- Ensure the pressure cable and ventilator tubing are connected to the oxylog 3000 body.
- There are 2 sizes of disposable ventilator hose – paediatric and adult. Paediatric hose (blue) is used for children weighing 15kg to 40kg. Above 40kg the adult hose (white) is used.

Paediatric disposable hose

Adult disposable hose

2. Turn the Oxylog 3000 ventilator on by pressing the  key.

3. Set the Oxylog 3000 (to ventilate an anaesthetised and muscle relaxed child)



Sub menu control dial

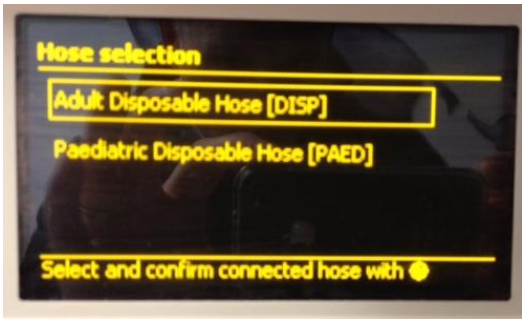
Tidal volume dial

Respiratory rate dial

Maximum pressure limit dial

Oxygen concentration dial

a) Choose the correct ventilator hose settings for the child



- For children weighing 15kg to 40 kg, choose the paediatric disposable hose setting by rotating the sub menu control dial and clicking.
- For children weighing more than 40kg, choose the adult disposable hose setting by clicking the sub menu control dial.

b) Choose IPPV mode by pressing the IPPV button.

c) Choose a tidal volume for your patient using the 'VT' dial.
   - A tidal volume of 5 to 8 ml/kg is normally required.

d) Choose a respiratory rate for your patient using the 'freq' dial

e) Set the maximum pressure limit to 30cmH_20 using the 'Pmax' dial

f) Set the inspired oxygen concentration to 60% and titrate up or down using the 'O_2' dial

g) The positive end expiratory pressure (PEEP) applied to your patient can be altered using the sub menu control dial.
   - Press the dial once and twist the dial to highlight the PEEP value on the screen then press the dial to select PEEP.
   - Once selected the value can be altered by rotating the dial.
   - To lock a value, press the dial once more.

4. Attach the ventilator to the catheter mount and attach to test lung

- Attach the ventilator tubing to the catheter mount.
- The catheter mount should be set up with a heat and moisture exchanger and filter (HMEF) and end tidal carbon dioxide monitoring, as per the picture below:

- Use the large HMEF (VT 150 - 1200 ml) when attaching to Oxylog 3000.
- **Ensure the test lung is returned to its storage place.**

5. Connect to the patient

a) Connect the catheter mount to the child's endotracheal tube.

b) Observe for the child's chest movement and end tidal carbon dioxide trace.

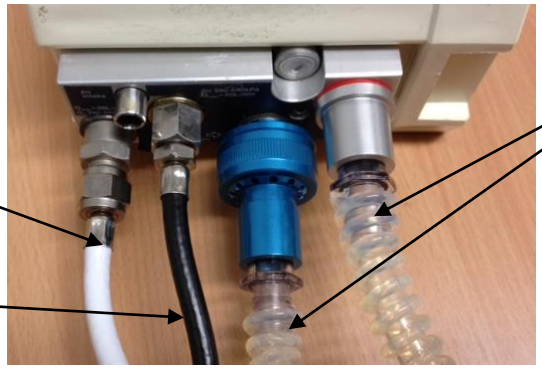
c) Adjust the ventilator settings according to patient need.

d) Change back to ventilating the child with a self inflating bag if no chest movement is obtained.

Paediatric Trauma Guidelines

Using the Babypac ventilator

1. Ensure the required cables are attached to the babypac



- Connect the white oxygen cable to the wall oxygen or a full CD oxygen cylinder using the Schraeder valve.
- The black air cable does not need to be connected to an air source for trauma patients.
- Ensure the ventilator tubing is connected to the babypac body.

- Correct connection of oxygen is indicated on the front panel of the babypac, with a white ball becoming visible.

Oxygen not attached or not flowing →

← Oxygen attached and flowing

2. Set the dials on the babypac ventilator (for a sedated and muscle relaxed child)

These are starting settings and normally will require adjustment once the ventilator is ventilating the patient.

If you are unsure of settings, discuss with the Paediatric Anaesthetic Consultant on-call.

a) Set the pressure limit to 30cmH_20. This does not need to be altered from now on.

Pressure limit dial

b) Set the inspiratory time to 0.75 seconds. This does not need to be altered from now on.

c) Set the expiratory time to 2 seconds. This gives a respiratory rate of 22.

d) Set the ventilator mode to 'CMV + ACTIVE PEEP', by turning the dial anti-clockwise.
- The ventilator will now begin cycling. Attach to a test lung.

e) Set the delivered oxygen to 60%

f) Set the PEEP to 5cmH_20.
- This position is half way through the white section of the dial.
- The actual PEEP delivered can be viewed on the pressure dial whilst ventilating the test lung.

g) Set the Peak inspired pressure to 20cmH_20.
- The pressure delivered can be viewed on the pressure dial whilst ventilating the test lung.

Inspiratory time dial

Expiratory time dial

Ventilator mode dial

Peak inspiratory pressure dial

Delivered oxygen dial

PEEP dial

3. Test the ventilators function and alarms

a) Set the ventilator mode to 'CMV + ACTIVE PEEP', by turning the dial anti-clockwise. The ventilator will now begin cycling and all the alarm lights flash in turn. A single burst of the high priority audible alarm is given at the same time. The orange silenced indicator should flash for 60 seconds.

b) Check that flow is coming from the patient connection port by feeling the flow when placed close to the back of the hand or to the face.

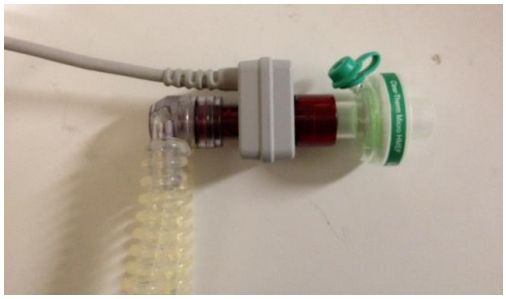
c) Occlude the proximal connection port of the patient circuit and check that the pressure dial gives a reading of between 15 and 25 cmH2O during each inspiratory phase. The audible alarm should not sound.

d) Leaving the high pressure alarm setting at 30 cmH_2O, set the inspiratory pressure to 40 cmH_2O. Occlude the proximal connection port of the patient circuit and the pneumatic audible alarm should sound, accompanied by the high inflation pressure visual alarm. The pressure dial should read between 25 and 35 cmH_2O. After occlusion for one second, the high priority electronic audible alarm will also sound. Turn the inspiratory pressure back down to 20 cmH_20.

e) Allow the ventilator to cycle with no obstruction at the output port and check that the low inflation pressure (disconnect) alarm operates after 8 seconds.

4. Connect the babypac ventilator tubing to an HMEF and ETCO2

- Connect the babypac ventilator circuit to the end tidal CO_2 adaptor and a small heat moisture exchanger and filter (VT 30 – 100 ml), as shown in the picture below:



1. Connect to the patient

a) Connect the assembled ventilator circuit to the child's endotracheal tube.

b) Observe for the child's chest movement and end tidal carbon dioxide trace.

c) Adjust the ventilator settings according to chest movement, end tidal carbon dioxide monitoring and pulse oximetry.

d) Change back to ventilating the child with a self inflating bag if no chest movement is obtained.