1  Overview

1) PEEP dial & manual breath button  2) thumb screw
3) PIP dial  4) humidity chamber
5) oxygen concentration display  6) calibration hole
7) oxygen analyser on/off switch  8) oxygen alarm limits
9) IMV, CPAP and heater switches  10) auto test switch
11) main on/off switch  12) ventilator rate display
13) Ti and Te setting switches  14) alarm silence
15) visual alarm and power indicators  16) ventilator pressure dial
17) auxiliary oxygen flow meter  18) oxygen regulator pressure dial
19) oxygen cylinder pressure dial  20) oxygen and air flow meters

2  Power supply

- Designed to operate from either 230V AC supply (dedicated ambulance), low-voltage DC supply (frontline ambulance) or internal rechargeable battery (separate to the incubator battery).
- Current power mode is displayed on the front panel\textsuperscript{15} as ‘bat’ (battery), ‘12v ext’ (DC) or ‘mains’ (AC)
### Exhalation Block

- **Connections**
  - Exhalation block fixes to left side of control panel with thumb screw (2).
  - When removing block for service or cleaning, a protective metal plate must be fixed to protect pins on the back.
  - Ventilator tubing and plugs for heater wire connect at the side of the block. Align the red dots on each plug up with the dots on the block when inserting. Red coloured connector marks the inspiratory port for the ventilator tubing.

- **Dials**
  - Top dial (1) on the block sets the PEEP.
  - Lower dial (3) sets the PIP.
  - Use the pressure dial (16) for accurate pressure settings.
  - Red button in the centre of PEEP dial acts as “manual breath”, delivering the set pressure when pushed.

### Gas Sources

- Oxygen supply can either come from onboard cylinders or from alternative source through white high-pressure hose.
- The ‘oxygen regulator pressure dial’ (18) shows if there is enough pressure in the system to drive the ventilator.
- If the circuit is bled, the ‘oxygen cylinder pressure dial’ (19) will show the contents of whichever cylinder is then turned on.
- Only have one cylinder open at a time.
- Use the front cylinder first as this is the easiest to change.
- Air supply can either come from on-board compressor or from an alternative source through the black high-pressure hose (there are no air cylinders on the trolley).

### Flow Meters

- Flow of air and oxygen into the ventilator must be balanced to achieve the desired $F_{I}O_{2}$.
- Two flow-meters (20) ranging from 1 to 10 litres/min allow this.
- Divide the gas supply in litres by the flow in litres/min to give the duration of supply (in minutes).
- When changing the $F_{I}O_{2}$, keep the same total flow, to avoid inadvertent changes to PIP and PEEP.
### Ventilation modes

- "**CPAP**" (9) will switch ventilator into ‘continuous positive airway pressure’ mode.
- The digital frequency indicator will show three bars (---).
- The red ‘manual breath’ button still functions at the set PIP.
- Note that there are no alarms
- **IMV** (9) sets the ‘intermittent mandatory ventilation’ mode.
- Visual and audible disconnection alarm activates.
- Inspiratory and expiratory times are set using the mechanical numerical display (13).
- A digital display labelled ‘Timer’ shows the calculated rate (12).
- Ti can be between 0.25 and 2 seconds; Te between 0.25 and 30 seconds. The display flashes if the settings are outside the ventilator’s operating limits.

### Alarms

- **Alarm silence.** ‘2 min’ switch mutes all ventilator audible alarms for 2 minutes.
- Visual alarms remain illuminated until problem is rectified.
- If alarm condition still exists after 2 minutes, or if a different alarm condition becomes apparent, alarm will sound again.

**Stenosis**

Warns if ventilator pressure does not fall below 12mmHg after 2 seconds. (Can be triggered by holding the red manual-breath button down.)

**Disconnect**

Activates if there is a leak at some point in the circuit and the ventilator cannot achieve a pressure of at least 12mmHg. Only functions in IMV mode. (Can be triggered by removing the test-lung.)

**O₂ Alarm**

An alarm sounds when the oxygen concentration passes above the maximum or below the minimum set. Alarm is active only when the O₂ monitor is switched on.
## 2. Document History

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<tr>
<td>Writing group</td>
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### Distribution

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### 3. Scope and purpose

- **Overall objectives:**
  The Stephan Reanimator is a transport ventilator which can provide CPAP and CMV. It requires an oxygen supply, but has an independent air compressor. This guideline covers its setup and use.

- **Statement of intent:**
  This guideline is not intended to be construed or to serve as a standard of care. Adherence to guideline recommendations will not ensure a successful outcome in every case, nor should they be construed as including all proper methods of care or excluding other acceptable methods of care aimed at the same results. The ultimate judgment must be made by the appropriate healthcare professional(s) responsible for clinical decisions regarding a particular clinical procedure or treatment plan.

- **Feedback:**
  Comments on this guideline can be sent to: scotamb.CPG@nhs.net

- **Equality Impact Assessment:**
  Applied to the ScotSTAR Clinical Standards group processes.

- **Guideline process endorsed by the Scottish Trauma Network Prehospital, Transfer and Retrieval group.**