

Trilogy 100 Ventilator Basics



By Helen Morley



Aims & Objectives:

- To follow on from basic understanding of the principles of ventilation, enabling the learner to gain a general overview of the functioning of the Trilogy 100 ventilator.
- To enable learner to successfully complete Trilogy 100 workbook.
- To be able to understand various alarms and initiate troubleshooting.



What types of ventilation does the Trilogy 100 provide?

- Both volume and pressure ventilation and delivers the therapy either invasively or noninvasively for children >5kg

- Pressure controlled therapy modes:

CPAP, Spontaneous/timed (S/T), Timed (T), Spontaneous (S), PC-SIMV

- Volume Control ventilation modes:

Controlled ventilation (CV), Assist Control (AC), SIMV



General overview



- **FRONT PANEL FEATURES:**

Start/stop button

Alarm indicator & audio pause button

Up/down button: allows navigation through system

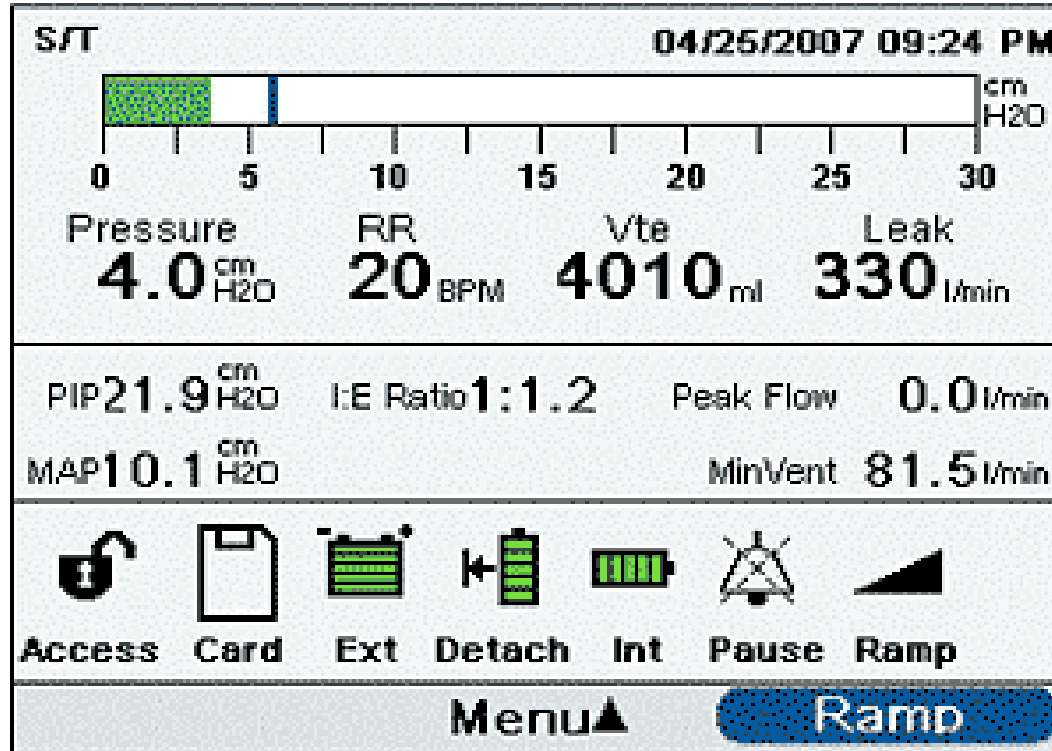
Left & right buttons: allows selection of display options

AC Power LED



Screen Display:

Information displayed reflects actual patient data



Main Screen Display:

- **Pressure**: displays current patient pressure
- **RR**: Respiratory rate reflected in breaths per min
- **Manometer**: displays airway pressure in the patient circuit at all times. It moves to the right as airway pressure increases during inspiration and moves to the left as pressure decreases during exhalation
- **PIP**: Max pressure delivered to patient during previous breath
- **MAP**: average of pressure in patients airways over 6 breaths
- **Patient breath**: blue dot displays a patient-triggered breath



- **I:E ratio**: comparison of time spent in inspiration to the time spent in expiration during the previous breath.
- **Peak flow**: max flow delivered to patient during previous breath
- **Min Vent**: amount of air delivered to patient over last minute
- **Leak**: total leak (non-returned flow) between the unit outlet and the patient, averaged over previous breath.
- **Rise Time**: time taken from expiratory pressure to inspiratory pressure
Eg 4= a rise time of 0.4 seconds



Common ventilation mode:

- Spontaneous timed (S/T):

Delivers bi-level pressure support based upon the IPAP & EPAP settings. It provides spontaneous and mandatory breaths.

A mandatory breath is delivered if the patient does not spontaneously breathe within the prescribed breath rate setting, therefore receiving a minimum number of breaths per min.

Duration of a spontaneous breath is determined by patient effort, duration of a mandatory breath is determined by the inspiratory time setting.



Alarms

Red alarm

High priority alarm:

- Loss of power
- Ventilator inoperative
 - Low circuit leak
 - Circuit disconnect
 - Low V_{te}
- Low min ventilation
 - Low battery

Yellow alarm:

Medium priority alarm:

- High temperature alarm
- Battery cell depletion



Troubleshooting Alarms:

- The alarm is silenced for 60secs once activated- never leave the patient unsupervised

Low min vent	<ul style="list-style-type: none">•Patient not reached target volume, potentially under ventilating•Check airway for secretions, blockages and leaks, is trachy insitu?•Check rise and fall of chest, colour, SpO2, consider hand ventilation•Alter head position•Check trachy cuff (if cuffed tube insitu)
Low circuit leak	<ul style="list-style-type: none">•Not enough leak in circuit for patient to exhale from•Remove obstruction
Vent failure	<ul style="list-style-type: none">•Remove from patient•Hand ventilate and seek alternative vent.
Low Inspiratory pressure	<ul style="list-style-type: none">•Pressure in circuit dropped & vent cannot maintain Inspiratory pressure•Check patient & circuit for leaks, disconnection•If no solution found, remove patient, hand ventilate, swap to alternate ventilator
Circuit disconnect	<ul style="list-style-type: none">•Reconnect patient to tubing



Battery power



- 3 hour internal and 3 hour detachable battery
- 5 green lights represent % of life in battery 1 bar =approx 36mins, 3 bars = approx 60%)
- At 20min battery life remaining, yellow alarm initiated
- At 10 min battery life remaining, red alarm initiated
- Takes 8 hours to recharge both batteries from depletion

