



Servo-c

Hands-on guide

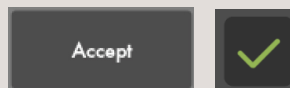
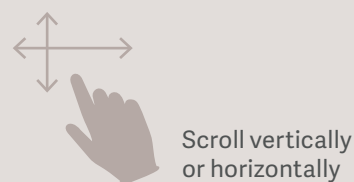
Introduction

– to lead you into it

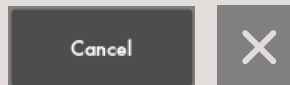
There are different ways to navigate the user interface, adjust settings and get support.

The objective with this Servo-c® hands-on guide is to guide you through some of the most important steps you need to familiarize yourself with when starting to use the Servo-c ventilator.

To go through these exercises you need a Servo-c, O₂ and Air supply, patient circuit, test lung and CO₂ cable/sensor (optional). The exercises can be done individually or in sections. It takes approximately 30 minutes to do the entire Servo-c hands-on guide.



Confirm the settings by tapping Accept or the green check mark.



Exit settings without changing by tapping Cancel or the x.



Close by tapping the x.

Servo-c. This guide is intended for hospital personnel as a hands-on training using the Servo-c ventilator. It does not cover all aspects of the Servo-c ventilator. Please see the user's manual for more information. Some modes and functions are options and might not be included.

Setting up the Servo-c

1. Plug in the power cord.
2. Connect the oxygen and air hoses.
3. Switch ON the ventilator. ①
4. Lock the wheels. It's important to lock the wheels when the ventilator is in use to avoid accidental movement of the ventilator.
5. Start the **PRE-USE CHECK**.
(You need the test tube during the Pre-Use Check).
6. Follow the instructions on the screen.
7. Included in the Pre-Use Check is the patient circuit test. Connect the patient circuit.

NOTE: Pre-Use Check includes pressure and flow transducers calibration. Each test starts automatically after the previous test is completed. The patient circuit test is included in the Pre-Use Check, but can be selected separately.

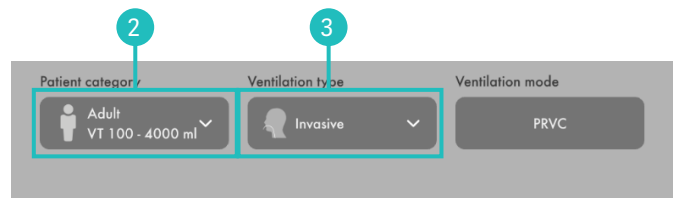
8. Connect a test lung to the patient circuit.
9. Choose patient category: **ADULT**. ②
10. Choose Ventilation type: **INVASIVE**. ③
(You can also choose NON INVASIVE here).
11. Tap on Ventilation mode **PRVC**. ④
(Depending on start up the configuration a different mode can be shown here.)

NOTE: Some modes are options and might not be included. Information is available for each mode.

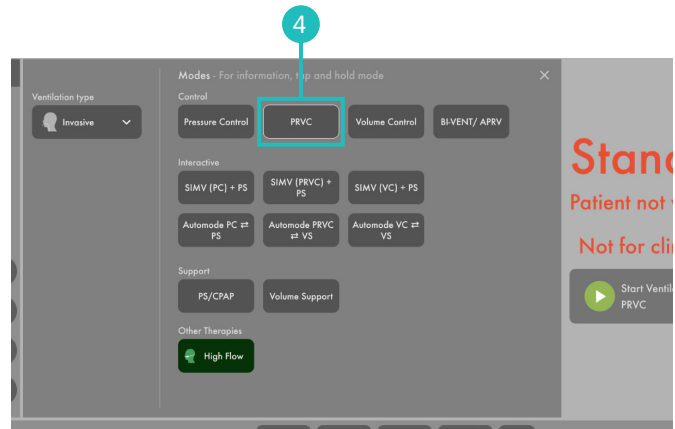
12. Then tap and hold the **PRVC** tile. ④
13. Close by tapping **✕**.
14. Select Mode by tapping **PRVC**. ④
15. Change the: ⑤
 - Tidal volume to 350 ml
 - Respiratory rate to 18 b/min
 - PEEP to 10 cm H₂O
16. Accept the mode settings. ⑥



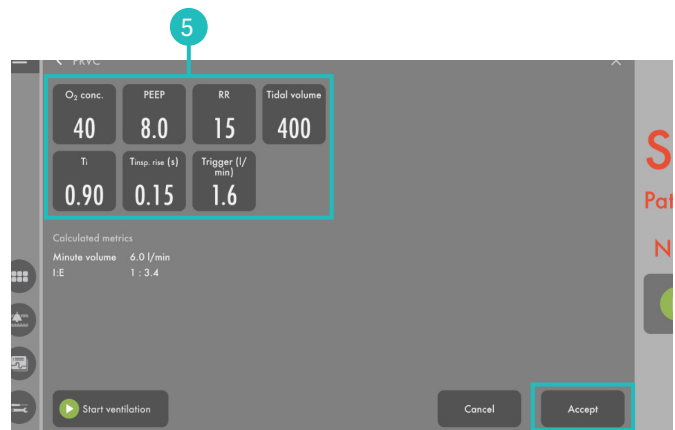
Step 1



Steps 9–10




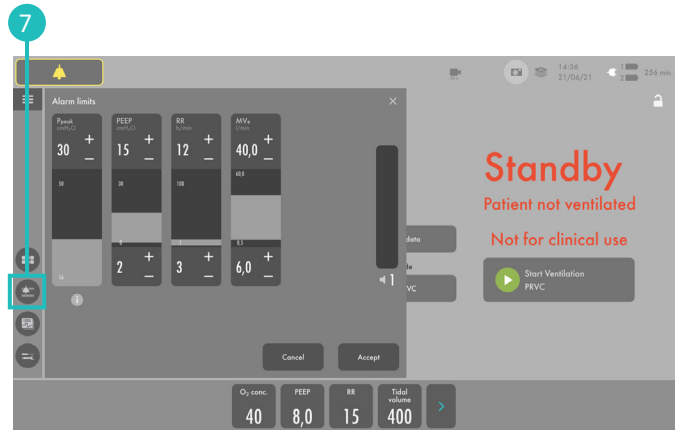
Steps 11–14



Steps 15–16

Alarms

17. Go to **ALARM SETTINGS**  in **MENU BAR**. **7**
18. Change the alarm limits:
 - Alarm sound: 6
 - Ppeak: 30 cm H₂O
 - RR (Respiration Rate): High 12 b/min
 - MVe (Minute volume): Low 6.0 L/min
19. **ACCEPT** the alarm settings.
20. Tap **START VENTILATION**.



Steps:17-20

21. The alarms are silenced for 30 seconds after starting ventilation. **8**

NOTE: Alarms can be in one of three colours: red, yellow or blue, depending on priority.

22. Tap the activated alarm in message bar **9** and read the messages.

NOTE: The number of alarms that are active are displayed in the status bar.

23. Tap the red tile in the numerical values **MVe** alarm. **10**
- NOTE: By tapping the activated alarm in the numerical values field, you gain access to the alarm setting (shortcut).**



Steps 21-23

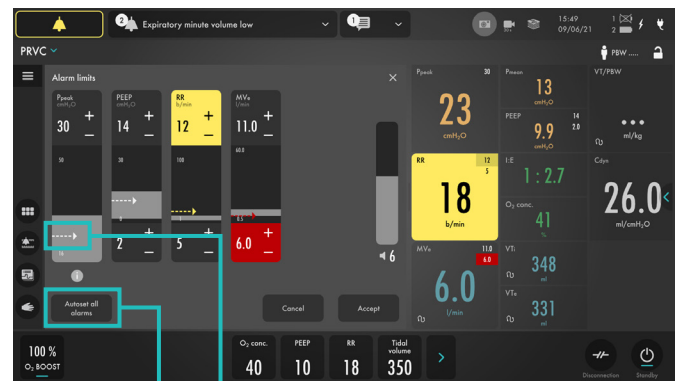
24. Go to alarm limits in the menu bar. Adjust the alarms so none are active.

NOTE: The arrow indicates the current measured value. **11**


25. Activate the **AUTOSET** function by tapping. **12**

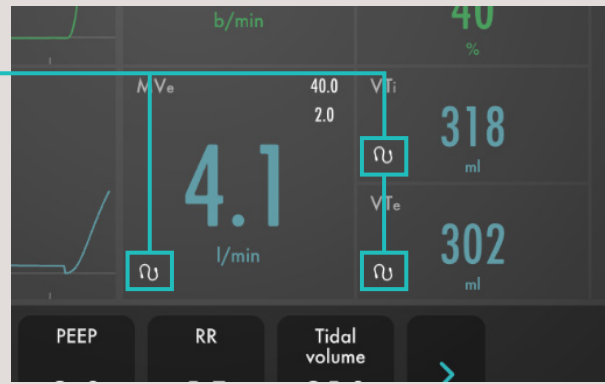
NOTE: The alarm autaset function can only be used in controlled modes.



26. **ACCEPT** the alarm settings.



Steps 24-26

NOTE: When ventilating, you can see that the patient circuit test has been performed by the symbol  – The symbol will not appear if a patient circuit test has not been done.



- Decrease the PEEP to 4 cm H₂O (use the direct access keys) and increase the scale by tapping the . **13** Then increase the PEEP to 26 cm H₂O. Cancel the settings by tapping the .

NOTE: The color changes when the settings are changed outside the normal range.



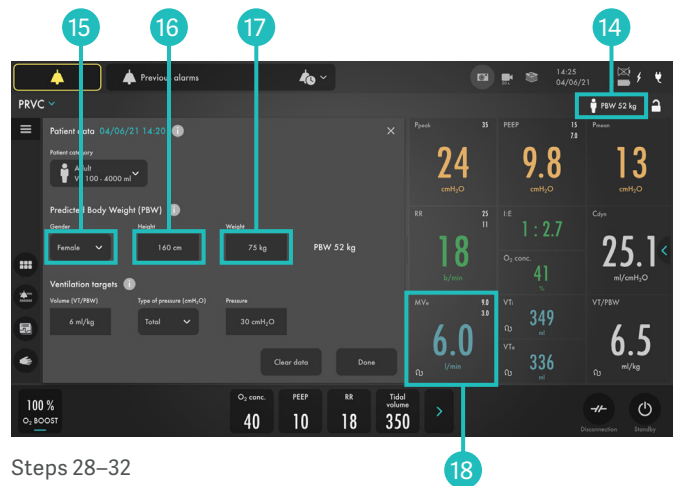
Step 27

VT/PBW

- Tap **PBW** in the status bar or tap menu/patientdata in the meny bar. **14**
- Enter gender **FEMALE**. **15**
- Enter **HEIGHT** 160 cm. **16**
- Enter **WEIGHT** 75kg. **17**

NOTE: The predicted body weight is often not the same as the patient's actual weight (in Pediatric patient category the actual weight is entered).

- Check the ml/kg measurement. **18**
- Go to the direct access bar and change the **TIDAL VOLUME** so you receive 6 ml/kg. **19**



Steps 28–32



Step 33

Mode setting

34. Tap the mode **PRVC** and open the mode setting. **20**

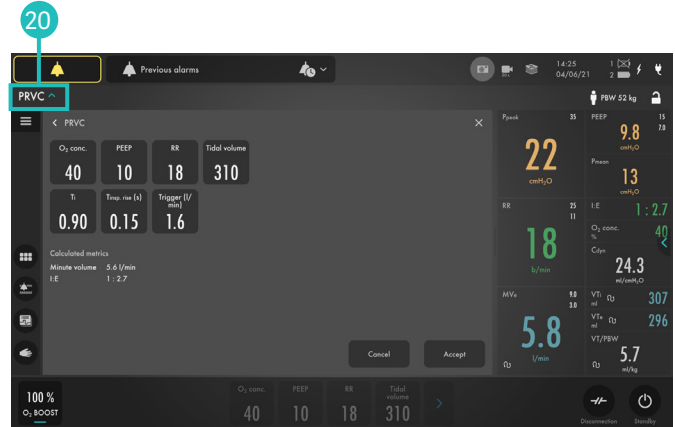
35. Change the **TRIGGER** value to pressure triggering -1 cm H₂O.

NOTE: Read the text by the scaling. Less patient effort and more patient effort. **21**

36. Change the I:E (or Ti if this is configured).

NOTE: The changes of the dynamic images.

37. **CANCEL** changes.



Step 34



Step 35

38. Make a quick change of O₂ to 100%. Change the O₂ setting in the direct access bar to 100% by tapping on the 100% directly on the sliding scale. **22**

39. **CANCEL** the changes by tapping the **X**.

40. Tap the **MODES SYMBOL**  in the Menu bar and choose PS/CPAP.

41. Change the **END INSPIRATION** to 40% and then to 60%. Look at how the dynamic image changes.

42. **ACCEPT** 60%.

43. **ACCEPT** PS/CPAP mode.



Steps 38-39

44. Compress the test lung to trigger breaths.

NOTE: The white indicates the triggering in the waveforms, depending on how the trigger is set (pressure or flow) the colour indication changes – if pressure triggering is set – white indication in pressure waveform. If flow triggering is set- white indication in flow waveform. Also there is a lung on the screen indicating the triggered breath. **23**

45. Stop compressing the test lung.

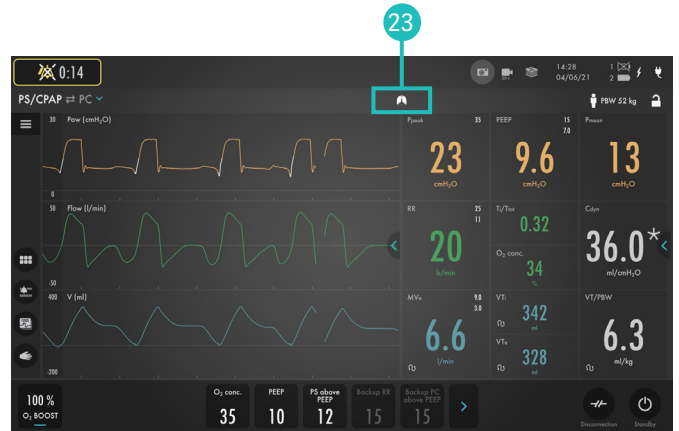
NOTE: The color changes to bold white for PC and the BACKUP settings. The mode and settings that are not active are grey. **24**

46. Tap the **>** in the direct access bar **25**, you then have access to all the mode settings directly.

47. Go to **MODES** **☰** and change back to **PRVC**.

NOTE: It is marked previous. **26**

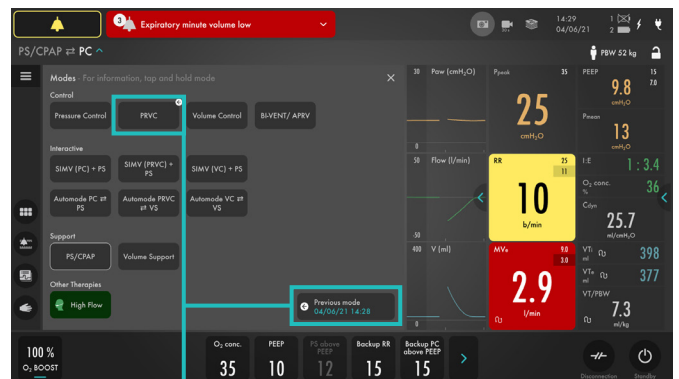
48. Accept previous settings.



Step 44




Steps 45–46



Steps 47–48

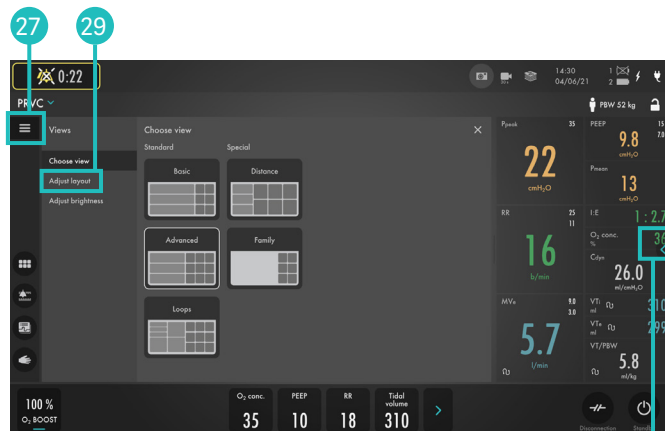
Views

49. Go to **VIEWS** in **MENU BAR**. 27
Change to BASIC view.
50. Use the  to find additional values. 28
51. Go through the different views; **DISTANCE**, **FAMILY**, and **LOOPS**. Go back to advanced view.
52. Go to **ADJUST LAYOUT**. 29

NOTE: Switch ON the Servo Compass. You can change the targets for ml/kg and driving or total pressure. Compress the test lung. Note the pressure symbol turns red. This indicates that ventilation is suboptimal and adjustments should be considered. There are no alarms in Servo Compass.

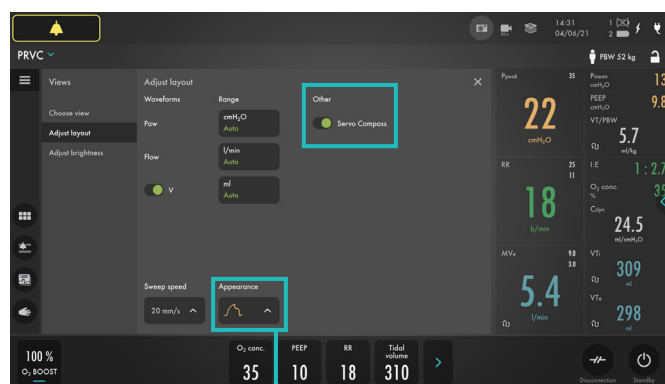
53. Change to filled waveforms by tapping the waveform image. 30
54. Change back to non-filled waveforms.

NOTE: You can also tap and hold on the waveforms to access screen layout.



Steps 49–52

28



Steps 53–54

30

Media

55. Tap the **RECORDER** once and tap the **CAMERA** in the status bar three times. 31

NOTE: A 30 second recording will be made starting 15 seconds before and lasting until 15 seconds after the recording is initiated.

56. Choose 32 to access **MEDIA**. Navigate between the different screenshots and the recording.
57. Find the USB-C port under the screen. Tilt the screen to find it. 33

NOTE: You can use a USB-C memory stick to export the data (e.g. screenshots, recordings and logs).




Steps 55–56



Step 57

33

Disconnect

58. Go to **DISCONNECTION**  in lower right corner. **34**
59. Change the **O₂ CONCENTRATION** to 60%. **35**
60. Accept **DISCONNECT** function.
61. Disconnect the test lung. The disconnect function automatically proceeds to the next step.
62. Reconnect the test lung.
63. **CANCEL** post-oxygenation.


NOTE: When disconnection is activated the ventilator system is prevented from cycling without activating alarms. The disconnection function should not be used if closed suction system is used.

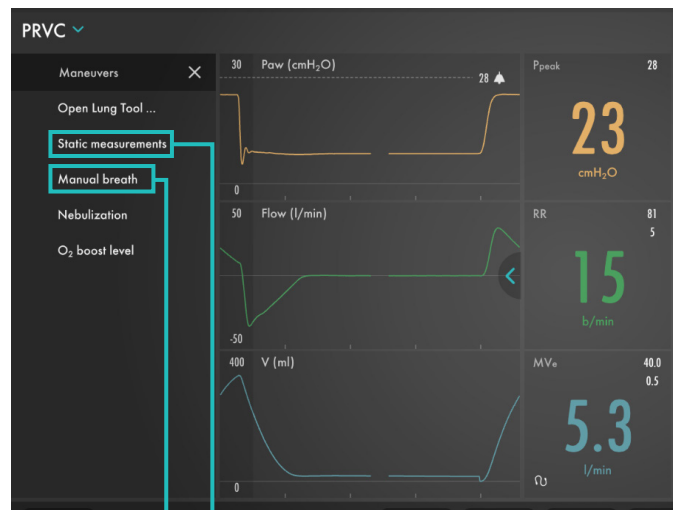


step 58–63 **35**

34

Maneuvers


64. Go to **MANEUVERS**  in **MENU BAR**.
65. Activate **MANUAL BREATH** by tapping. **36**
66. Go to **STATIC MEASUREMENT**. **37**



step 64–66 **36 37**

67. Tap **INSPIRATORY HOLD** and hold for 4 seconds, and then **EXPIRATORY HOLD** for 4 seconds. **38**
68. Observe the PEEP_{tot} value.

NOTE: PEEP_{tot} value is the set PEEP + intrinsic PEEP.

69. Tap the . You can find more information about static measurement setting there.

NOTE: The information sign can be found in different positions on the Graphic User Interface.



step 67–69 **38**

Maneuvers (continued)

70. Go to **MANUEVERS** and **NEBULIZATION**.

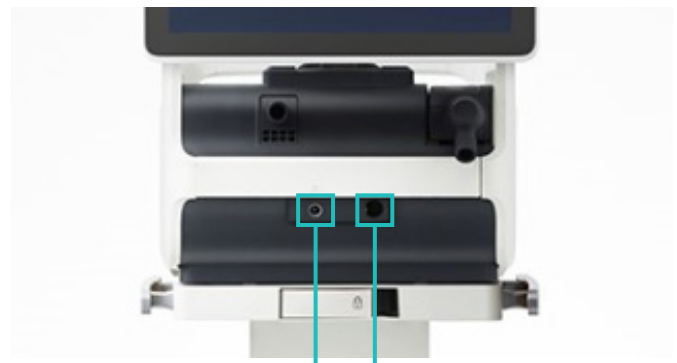
NOTE: You can choose continuous nebulization or a nebulization period. The time for nebulization can be changed. When nebulization is activated there will be the corresponding nebulization symbol on the screen. By tapping the symbol you can stop nebulization.



Step 70

71. The nebulizer connection is next to the CO₂ connector.

39



Step 71

CO₂ Calibration

(CO₂ is optional and may not be included)

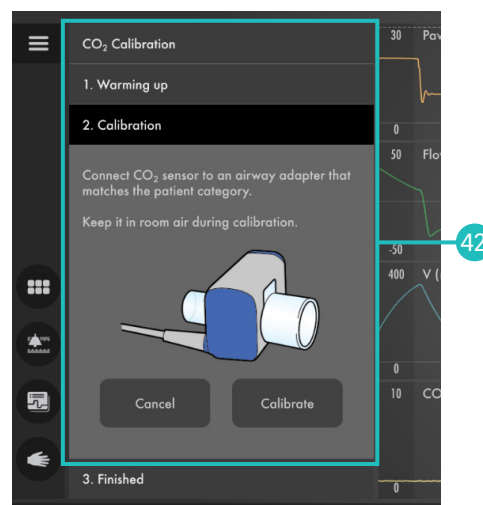
72. Insert the CO₂ cable in the outlet on the front of the ventilator. When the CO₂ cable is connected you will see it in the waveform area. Tap "calibrate" or the CO₂ symbol on top of the screen to calibrate. If you connect the CO₂ sensor to the patient circuit before calibrating you will only see the waveform and no metric values.



Step 72


73. Tap calibrate follow the instructions on the screen. Tap the CO₂ symbol to deactivate CO₂ measurement. To activate the CO₂ tap on the symbol.

74. Remove the CO₂ cable.

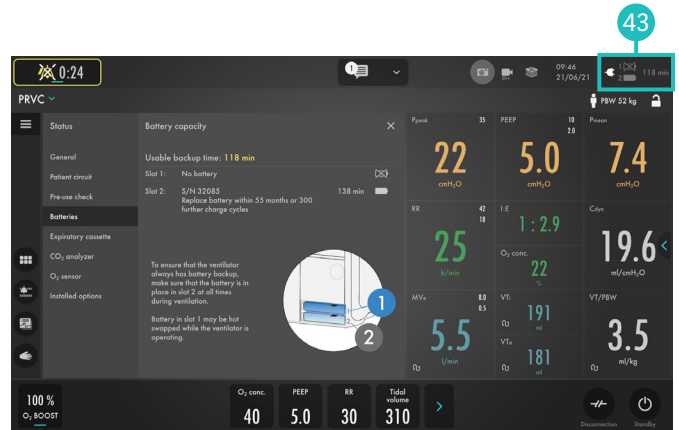


Step 73

Battery

- Unplug the mains cable.
- Click on the battery symbol . **43**
The battery compartment is divided into two slots – slot 1 (optional) and slot 2 (main). The battery module in slot 1 may be exchanged during ventilation.

NOTE: You can see how much capacity remains for each battery.



Step 75



Lock screen

- LOCK SCREEN** is found in the upper right corner. Lock the screen. **44**
- Tap anywhere on the screen and see what happens.
- UNLOCK** the screen by tapping and holding on the screen.



Step 77

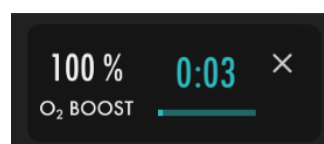
O₂ boost

- Activate **O₂ BOOST** by tap and hold. **45**
NOTE: O₂ boost is active for one minute. The alarms are silent for 2 min.
- CANCEL** O₂ boost by tapping .
- Go to  and configure **O₂ BOOST**. Unlock the 100% O₂ boost by tapping the 100% lock symbol. **46**
- Observe the new **O₂ BOOST** level. Change the **O₂ BOOST LEVEL** to 40% and accept.

NOTE: The value entered under O₂ boost (%) level specifies the number of percentage units that will be added to the value set for the O₂ concentration. For example: if the current O₂ concentration is 40% and the O₂ boost level is 30%, the O₂ boost function will, when tapped, deliver 70% O₂. The O₂ boost function figure displayed will change accordingly. Since the minimum O₂ concentration is 21%, the O₂ boost (%) level scale goes from 0 to 79%.




Step 80



Step 81

Trends

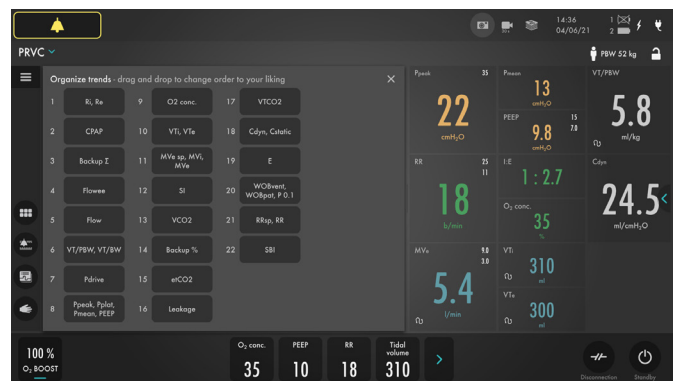
- 84. Go to **TRENDS**  in the **MENU BAR**. **47**
- 85. Change the trend scale to 1 hour. **48**
NOTE: Trend values are stored every 60 seconds and retained for a maximum of 72 hours.
- 86. Drag the cursor and note that each event/changes have been trended.
- 87. Tap **ORGANIZE TRENDS** to change the order of the trends. **49**
- 88. Put the RR sp, RR at the top by dragging and dropping **TRENDS**.

NOTE: You can see the trend of VT/PBW.

- 89. Close the window by tapping .




Steps 84–87 **49** **47** **48**



Step 88

Stop ventilation

- 90. Tap and hold  to stop ventilation. You can also find the Standby in the menu bar. **50**



Step 90 **50**



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Knowledge check

1. Which priority level does the red alarm have? HIGH, MEDIUM or LOW priority?

2. Can autoset of alarm settings be used in supported modes?

3. How can you see on the screen that the patient is triggering?

4. What values need to be entered in order to get the parameter for ml/kg?

5. Can O₂ Boost level be changed?

6. Where on the screen can the alarm volume be changed?

Answers

1. Red – High Priority alarms. Yellow – Medium priority alarms. Blue – Low priority alarms.
2. Autoset is not available in supported or NIV modes or in STANDBY because the ventilator system requires patient values in order to propose alarm limits.
3. There is a lung on the screen indicating the triggered breath. Also there is a white indication in the waveform (if pressure triggering is set- white indication in pressure waveform and if Flow triggering is set – white indication in flow curve).
4. You need to enter the gender and height for adults (PBW) and the weight for pediatric patients to get ml/kg value.
5. Yes, go to Manuevers – O₂ boost level.
6. The alarm sound level can be changed in the alarm menu.