Servo-u

– hands on guide

GETINGE

Introduction

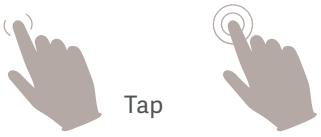
There are different ways to navigate the user interface, adjust settings and get support.

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

To go through these exercises you need a Servo-u version 4.6, O_2 and Air supply, patient circuit and a test lung.

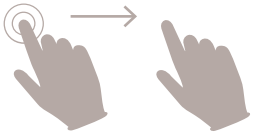
The exercises can be done individually or in sections. It takes approximately 30 minutes to do the entire Servo-u hands-on guide. Knowledge Check questions with answers can be found at the end of the guide.

Note: Some modes and functions are options and might not be included.

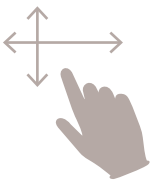


Tap

Tap and hold



Drag and drop



Scroll vertically or horizontally

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

Exit settings without changing by tapping Cancel or the red x.

Close by tapping the green x.

Servo-u This guide is intended for hospital personnel as a hands-on training using the Servo-u ventilator. It does not cover all aspects of the Servo-u ventilator. Please see the user's manual for more information.

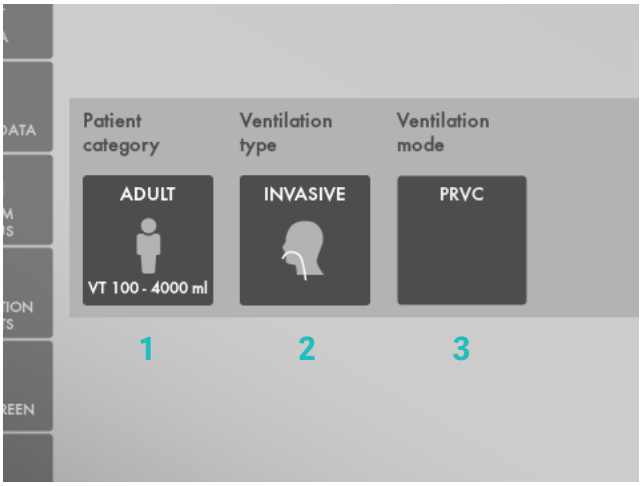
Setting up the Servo-u

1. Plug in the power cord.
2. Open the hatch on the side and switch the ventilator to on.

   Note: When switching on the Servo-u, you need to pull on the ON/OFF switch.
3. Connect the air and oxygen hoses.
4. Start the **PRE-USE CHECK**.
   (You need the test tube during the Pre-use check).
5. Follow the instructions on the screen.
6. 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.
7. Connect a test lung to the patient circuit.
8. Choose patient category: **ADULT. (1)**
9. Choose Ventilation type: **INVASIVE. (2)**
   (You can also choose Non-invasive here).
10. Tap on Ventilation mode **PRVC. (3)**
    (Depending on start up the configuration a different mode can be shown here).

    Note: Some modes are options and might not be included.
11. Then tap and hold the **PRVC** tile. **(4) . Information is available for each mode.**
12. Close by tapping ✕ .

2-3



8-10

11–12

13. Select Mode by tapping **PRVC**.

14. Change the:
    - Tidal volume to 350 ml
    - Respiratory rate to 15 b/min
    - PEEP to 10 cmH_2O

15. **ACCEPT** the mode settings. **(1)**

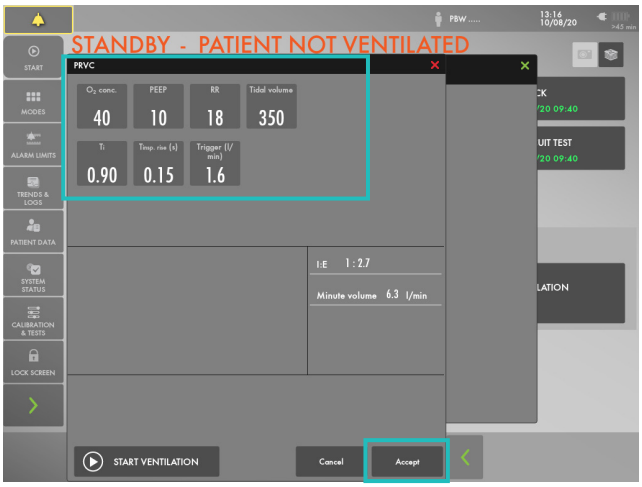
16. Go to **ALARM LIMITS** in **QUICK MENU**. **(2)**

17. Change the alarm limits:
    - Ppeak: 30 cmH_2O
    - RR (Respiration Rate): High 12 b/min
    - MVe (Minute volume): Low 8.0 L/min

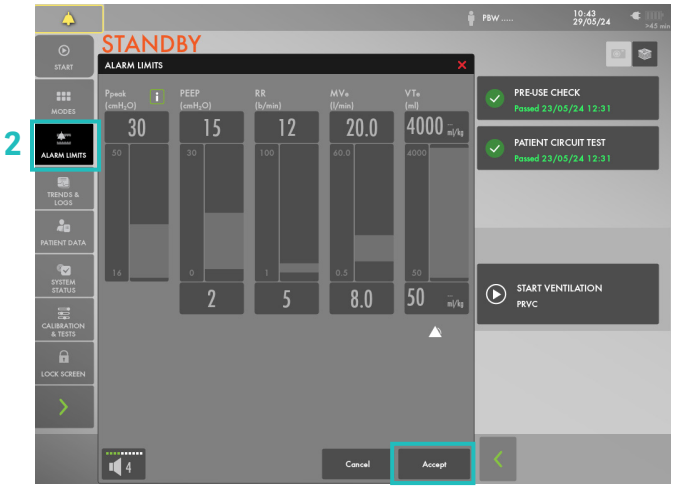
    Note: VTe alarm limit can also be set.

    - **ACCEPT** the alarm settings. **(3)**

18. Tap **START VENTILATION**.



13–15 **1**



2

16–17 **3**

Alarms

19. The alarms are automatically silenced for 30 seconds after starting ventilation. **(4)**
    Note: Alarms can be in one of three colors: red, yellow or blue, depending on priority.

20. Tap the activated alarm in message bar **(5)** and read the messages.
    Note: The number of alarms that are active are displayed in the status bar at. (6)

21. Tap the red tile in the numerical values **MVe** alarm. **(7)**
    Note: By tapping the numerical value, you gain access to the alarm setting (shortcut). The shortcut to the alarm steetings is also available when there is no active alarm.

4 **5** **6**

7

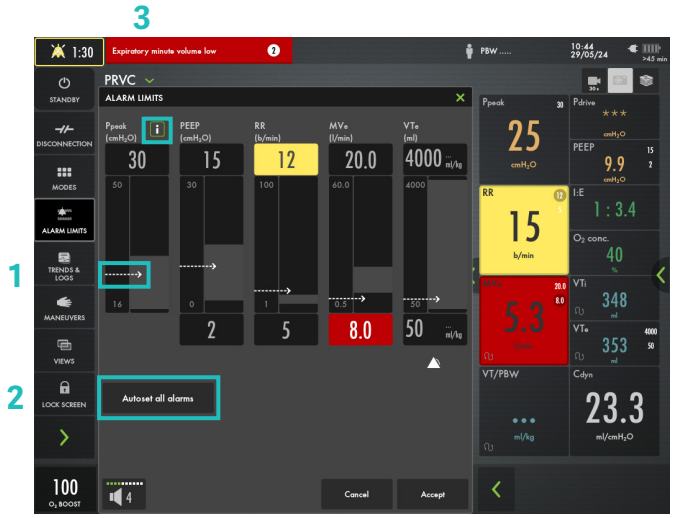
19-21

22. Go to ALARM LIMITS. Adjust the alarms so none are active.
Note: The arrow indicates the current measured value. (1)

23. Activate the **AUTOSET** function by tapping. **(2)**
Note: The alarm autoset function can only be used in controlled modes.

24. Tap the i placed next to Ppeak alarm setting. **(3)**
You can find more information about the alarm setting there.
Note: The information sign can be found in different positions on the Graphic User Interface.

25. **ACCEPT** the alarm settings.



22–25

Note: When ventilating, you can see that the patient circuit test has been performed by the symbol Ω - The symbol will not appear if a patient circuit test has not been done. (4)

Note

26. Decrease the PEEP to 4 cmH_2O (use the direct access keys) and increase the scale by tapping the ⊕. **(5)**
Then increase the PEEP to 26 cmH_2O.
Cancel the settings by tapping the ✕.
Note: The color changes when the settings are changed outside the normal range.

26

VT/PBW

27. Tap **PBW** or the **VT/PBW** to open **PATIENT DATA**. **(1)**
28. Enter gender **FEMALE**.
29. Enter **HEIGHT** 160 cm.
30. Enter **WEIGHT** 75 kg.

    Note: The predicted body weight is often not the same as the patient's actual weight (in Neonatal and Pediatric patient categories the actual weight is entered).

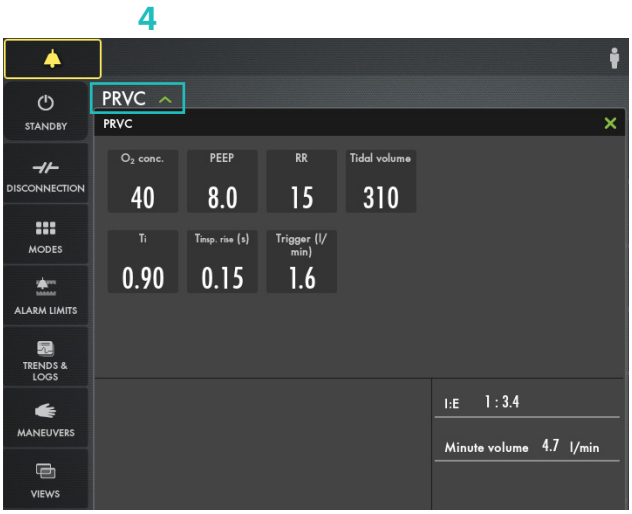
31. Check the ml/kg calculated value. **(2)**
32. Go to the direct access bar and change the **TIDAL VOLUME** so you achieve 6 ml/kg. **(3)**

27-31

32

Mode setting

33. Tap the mode **PRVC** and open the mode setting. **(4)**



33

34. Change the **TRIGGER** value to pressure triggering - 1 cm H_2O.

    Note: Read the text by the scaling. Less patient effort and more patient effort. (1)

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

    Note: The changes of the dynamic images.

36. **CANCEL** changes.

34 1

37. Make a quick change of O_2 to 100%. Change the O_2 setting in the direct access bar to 100% by tapping on the 100% directly on the sliding scale. **(2)**

38. **CANCEL** the changes by tapping the ✕.

37-38 2

39. Tap **MODES** in the QUICK MENU and choose PS/CPAP.

40. Change the **END INSPIRATION** to 40 % and then to 60%. Look at how the dynamic image changes and read the text- Longer and shorter inspiration.

41. **ACCEPT** 60%.

42. **ACCEPT** PS/CPAP mode.

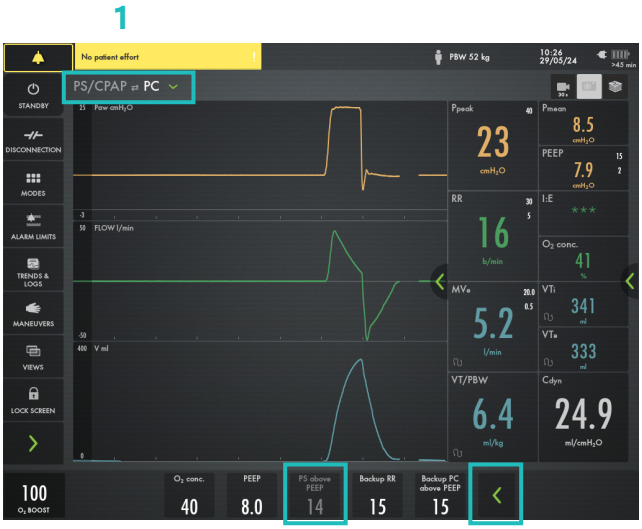
43. Compress the test lung to trigger breaths.

    Note: The white indicates the triggering in the wave-forms, depending on how the trigger is set (pressure or flow) the color 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.

39-43

44. 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. (1)

45. Tap the ‹ in the direct access bar **(2)**, you then have access to all the mode settings directly.



44-45

46. Go to **MODES** and change back to **PRVC**.

Note: It is marked previous. (3)

47. Accept previous settings.

46-47

Views

48. Go to **VIEWS** in **QUICK MENU**. **(4)**
Change to BASIC view.

49. Use the ‹ to find additional values. **(5)**

48-49

50. Go through the different views; **DISTANCE, FAMILY, LOOPS** and **SERVO COMPASS** view.

50

51. If SERVO COMPASS view is available, tap on the **SERVO COMPASS**.
Note: You can choose the target for ml/kg and Driving or total pressure.

52. Compress the testlung.
Note: The pressure symbol turns red.

53. Change back to **ADVANCED** view.

51–53

54. Tap an hold on the waveforms to access screen layout.

55. Change to filled waveforms by tapping the waveform image. **(1)**

Note: Here the SERVO COMPASS can be switched on/off. (2)

54-55

Library

56. Tap the **RECORDER** once and tap the **CAMERA** in the status bar three times. **(1)**
Note: A 30 second recording will be made starting 15 seconds before and lasting until 15 seconds after the recording is initiated.

57. Choose **(2)** to access **LIBRARY**. Navigate between the different screenshots and the recording.
Note: Screenshots are displayed at the bottom of the window.

58. Find the USB port under the base of the screen.
Note: You can use a USB memory stick to export the data (e.g. screenshots, recordings and logs).

56-58

59

NAVA

Now go through the NAVA workflow without inserting the Edi catheter.

59. Go to **NAVA** in the **EXTENDED MENU**. **(3)**

60. Find the workflow of NAVA/NIV NAVA under the ℹ.

61. Go to **EDI CATHETER INSERTION**.

62. Choose **16FR EDI CATHETER**. Choose **NASAL** insertion.

63. Enter **NEX** 52 cm.

64. Edi catheter insertion distance is presented.
Note: The insertion distance calculation often needs to be titrated using the ECG.

65. Tap all the ℹ.

66. Close by tapping the ✕.

61-66

Disconnection

67. Go to **DISCONNECTION** in **QUICK MENU**. **(1)**
68. Change the **O_2 CONCENTRATION** to 40%. **(2)** and accept.
69. Disconnect the test lung.
70. Reconnect the test lung.
71. **FINISH** post-oxygenation.

    Note: When disconnection is activated the ventilator system is prevented from cycling without activating alarms.

72. Go back to **DISCONNECTION** again and accept O_2 pre oxygenation and choose **PAUSE VENTILATION.** You need to tap and hold to activate. The ventilation is paused immediately.

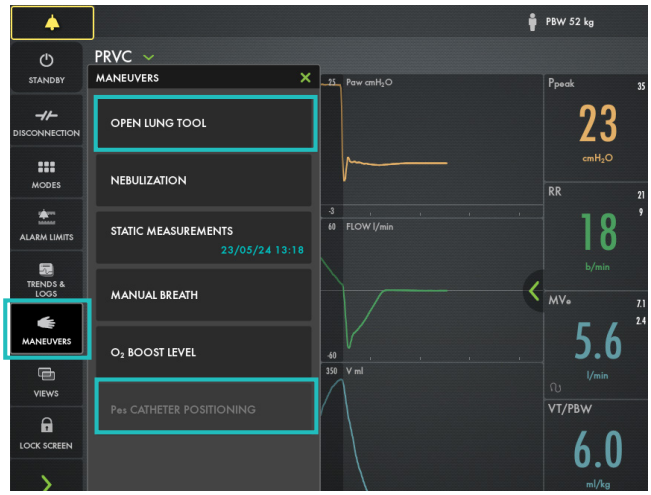
    Note: that there is a time limitation if you do not disconnect within 15 seconds the ventilation will start.

73. Disconnect the circuit and then reconnect the circuit and FINISH post-oxygenation.
74. Go to **MANEUVERS** in **QUICK MENU**. **(1)**
    Note: Open Lung Tool and Transpulmonary pressure are options and might not be available.

67-69

72-73

Maneuvers



74

75. Go to **NEBULIZATION**.

Note: You can choose a nebulization period or continuous nebulization . 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.

75

76. Go to **STATIC MEASUREMENTS.**
Tap **INSPIRATORY HOLD** and hold for 4 seconds, and then **EXPIRATORY HOLD** for 4 seconds. **(2)**
Tap the . You can find more information about static measurement calculation there.

77. Go back to maneuvers and activate **MANUAL BREATH** by tapping.

76-77

Battery

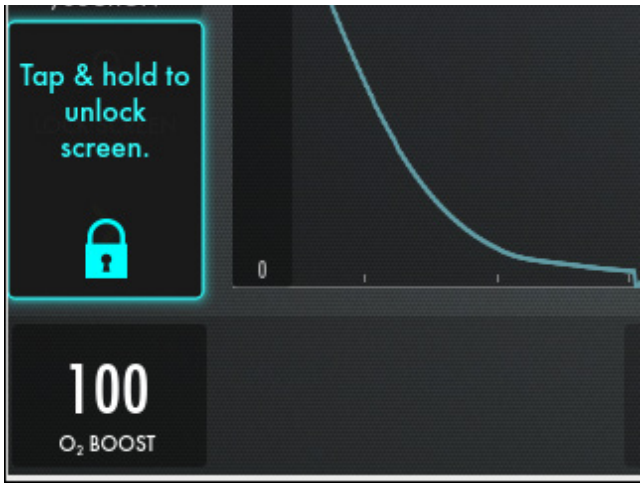
78. Unplug the mains cable.
79. Click on the battery symbol . **(1)**

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

78-79

Lock screen

80. **LOCK SCREEN** is found in **QUICK MENU**.
81. Tap anywhere on the screen and see what happens.
82. Unlock the screen by tapping on the **LOCKING SYMBOL**.



80-82

O_2 boost

83. Activate **O_2 BOOST** by tap and hold. **(2)**

    Note: O_2 boost is active for one minute.

84. **CANCEL** O_2 boost by tapping .
85. Go to **MANEUVERS** and select **O_2 BOOST**. Unlock the 100% O_2 boost by tapping the 100% lock symbol.
86. Observe the new **O_2 BOOST** level. Change the **O_2 BOOST LEVEL** to 40% and accept .

83-86

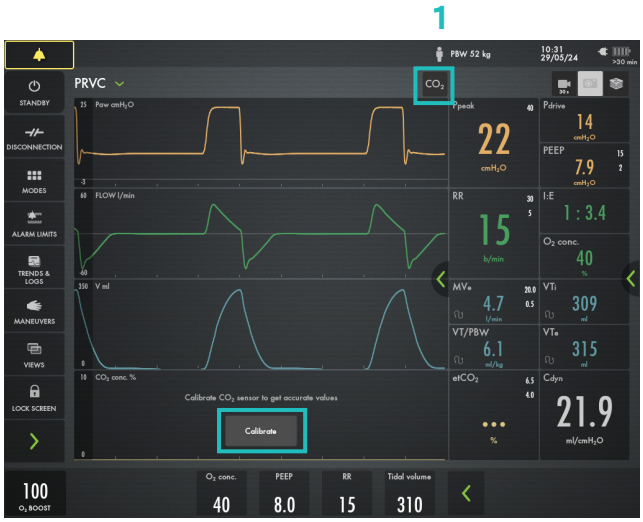
CO_2 Calibration

(CO_2 is optional and may not be included, then you can skip this section)

87. Insert the CO_2 module. When the CO_2 cable is connected you will see it in the waveform area.

88. Tap "calibrate" or the CO_2 symbol on top of the screen to calibrate. **(1)**

    Note: If you connect the CO_2 sensor to the patient circuit before calibrating you will only see the waveform and no metric values.



87-88 1

89. Tap calibrate follow the instructions on the screen. **(2).**

90. Tap the CO_2 symbol to deactivate CO_2 measurement.

    Note: To activate the CO_2 tap on the symbol.

89-90 2

Trends

91. Go to **TRENDS** in the **QUICK MENU** . **(1)**
92. Change the trend scale to 1 hour. **(2)**

    Note: Trend values are stored every 60 seconds and retained for a maximum of 72 hours.

93. Drag the cursor and note that each event/changes have been trended.
94. Tap **ORGANIZE TRENDS** to change the order of the trends. **(3)**
95. Put the RRsp, RR at the top by dragging and dropping **TRENDS**.
96. Close the window by tapping ✕ .

1

91-96 3 2

97. Tap the green arrow to the right of the waveform area. **(4)**

    The short trends of the numerical values in the first column are displayed and can be shown in both Basic and Advanced views. By default they show the last 15 minutes but can show a maximum of 72 hours.

4

97

High Flow therapy

If you have the High Flow therapy installed.

98. Tap **MODES**.

It is possible to go to High Flow therapy directly without going to Standby.

97-98

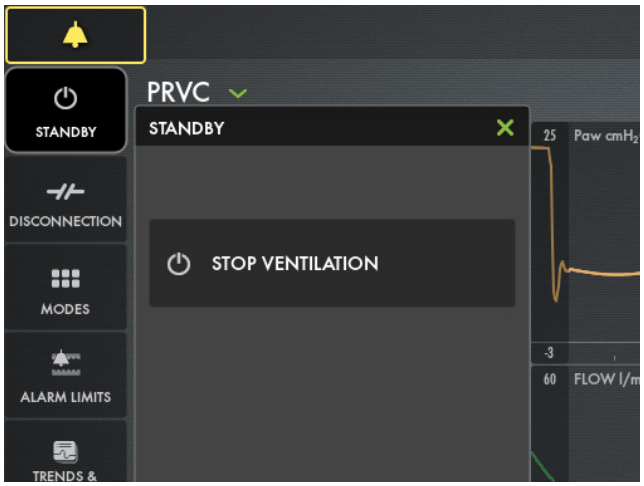
Note: on screen instructions are available.

Note

Stop ventilation

99. Tap **STANDBY** in **QUICK MENU** and then tap and hold **STOP VENTILATION**.

Note: If Edi is connected it is possible to go directly to Edi Monitoring in standby.



99

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. Is pressure Triggering of -1 easier or more difficult than Flow triggering of 1.6 l/min. (for the patient to trigger the breath)?

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

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. Flow triggering of 1.6l/min is easier to trigger the breath than pressure triggering of -1.
4. There is a lung on the screen indicating the triggered breath. Also there is a white indication in the waveforms. (if pressure triggering is set- white indication in pressure waveform and if Flow triggering is set- white indication in flow curve).

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This document is intended to provide information to an international audience outside of the US. Servo-u may be pending regulatory approvals to be marketed in your country. Contact your Getinge representative for more information.

Getinge is a leading global provider of innovative solutions for operating rooms, intensive-care units, hospital wards, sterilization departments and for life science companies and institutions. Based on first-hand experience and close partnerships, Getinge offers innovative healthcare solutions that improve every-day life for people, today and tomorrow.

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